Univeristy College London
The Bartlett
Faculty of the Built Environment

Spatial Palindromes / Palindromic Spaces

Spatial Devices in Vitruvius, Mallarmé, Polieri, Perec and Libeskind

PhD by Text
Supervisors: 1st Dr. Barbara Penner, 2nd Prof. Jane Rendell

Sotirios Varsamis

July 2010

Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Sotirios Varsamis

July 2010

Acknowledgements

This work has been completed with the contribution of the Greek State Scholarships foundation, IKY.

First of all I would like to thank my supervisors Dr. Barbara Penner and Prof. Jane Rendell without whom I would never dare to research such a peculiar subject. Barbara's insightful guidance and painstaking attention to detail has been a source of inspiration and confidence through the years. Jane's constant support and creative criticism has helped to overcome many actual and intellectual obstacles.

I would like also to express gratitude to Prof. of literature Erika Greber for her valuable information at the early stages of this research, Prof. of mathematics Leonidas Pitsoulis for his help with mathematical concepts and multimedia artist Franck Ancel for providing Polieri's bibliography.

I am deeply grateful to music producer Robin Morrison for composing the music for the *EROS / SORE* video, film director Aggelos Abazoglou for the reading of Perec's *Le Grande Palindrome*, actor Efi Dementi, architect Ioannis Kouvidis and architect Stamatios Zografos for participating at the *Spatial Palindrome I* video.

This work owes a lot to the long and inspiring conversations with my friends and fellow researchers Popi Iakovou, Christos Papastergiou and Christianna Ioannou. My gratitude goes to all of my friends who stood next to me all these years, especially Stefan Schulz-Rittich, Gianna Plainioti, Stellios Plainiotis, Petros Ioannou, Efi Zampeli, Efi, Lee Palmer, Lissa McKendrick, Nikiforos Klironomos, Anastasia Anapolytanou, Meropi Zavlari, Elpiniki Zachari, Glykeria Gkougkoudi, Athanasios Baxevanos.

All my love to my brother Dimitris, Dora and my nieces and very specially to Vassiliki Perstemli.

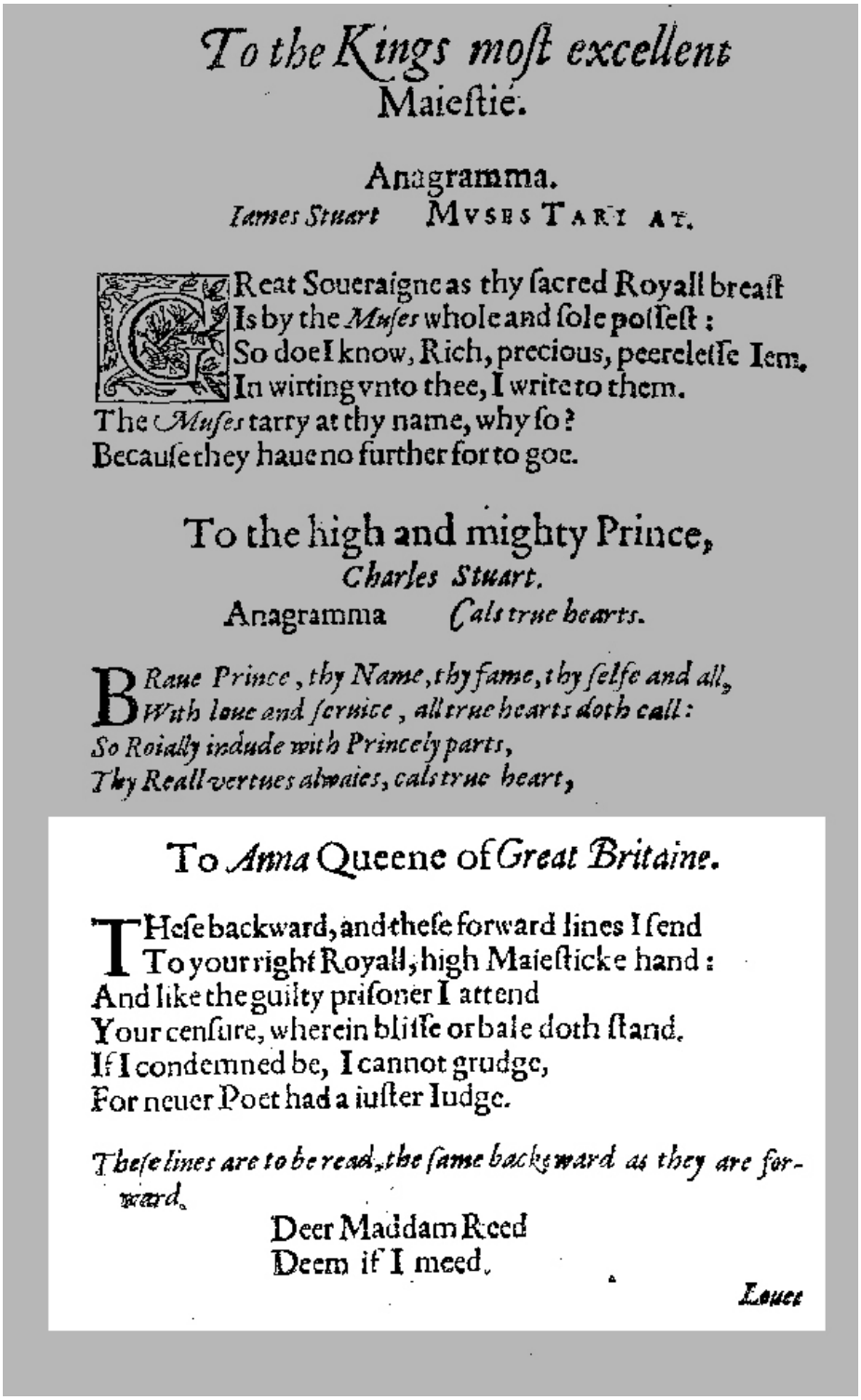
I would like to thank you all beyond words…

I want to dedicate this work to my mother Chrisoula and my father Emilios.

Contents

Table of Figures

Introduction



To the Kings moſt excellent
Maieſtie.

Anagramma.
Iames Stuart MVSES TARI AT.

GReat Soueraigne as thy ſacred Royall breaſt
Is by the *Muſes* whole and ſole poſſeſt:
So doe I know, Rich, precious, peereleſſe Iem,
In wirting vnto thee, I write to them.
The *Muſes* tarry at thy name, why ſo?
Becauſe they haue no further for to goe.

To the high and mighty Prince,
Charles Stuart.
Anagramma *Cals true hearts.*

BRaue Prince, thy Name, thy fame, thy ſelfe and all,
With loue and ſeruice, all true hearts doth call:
So Roially indude with Princely parts,
Thy Reall vertues alwaies, cals true heart,

To *Anna* Queene of *Great Britaine.*

THeſe backward, and theſe forward lines I ſend
To your right Royall, high Maieſticke hand:
And like the guilty priſoner I attend
Your cenſure, wherein bliſſe or bale doth ſtand.
If I condemned be, I cannot grudge,
For neuer Poet had a iuſter Iudge.

Theſe lines are to be read, the ſame backeward as they are forward.

Deer Maddam Reed
Deem if I meed.

Louet

Figure 1 Possibly the oldest palindrome in English. From John Taylor, *The Nipping and Snipping of Abuses*, London, 1614.

Palindrome and Architecture

The main aim of this research is to locate the area where the disciplines of text and architecture meet and explore how an understanding of this relationship could contribute to the creative process of design: in other words, how it is possible to bring text and architecture together and examine cases where buildings can be read and texts drawn. This dissertation uses the palindrome as a case study because it illustrates the above relation in a simple way; it is a non-linear geometric device, belonging to the anagram family, applied to text, narrative, drawing or building following the laws of mirrored symmetry and motional and temporal reversibility. In architecture, palindromic characteristics tend to be identified either in designs or in buildings as mirrored symmetries, ornaments, inscriptions in arches and domes, springs and fountains.

Within the world of literature, the palindrome is an anagrammatic method of writing closely related to memory. It has a strong relation to other labyrinthine narratives, which, according to author A.S. Byatt (b. 1936), novelist and poet, could be defined as narratives where '"topological structures", referring both to mathematical game-playing and narratives constructed with spatial rather with temporal images',[1] are applied to literature and where game-play, metamorphosis, memory and the issue of time – in its relativity – are fields of experimentation.

We find palindromes in a variety of disciplines – mathematics, music, painting, physics, performance arts – related either to the use of language and scripture or to the use of each discipline's 'language' (numbers, notes, forms, etc.). In literature we can distinguish between a palindromic text, narrative or book according to how the palindromic constraint appears. A palindromic text results when the

[1] A.S. Byatt, 'On Histories and Stories', in *Selected Essays* (Vintage, 2001), p. 139.

material elements of scripture (letters) are manipulated under constraint. The palindromic narrative results when the story's concepts, events or images are manipulated by the constraint. The palindromic book can be considered as the material space of the text or the narrative, where these two (text and narrative) exist and communicate to the reader. Text, narrative and book are interrelated and exist one inside the other, creating the space of literature.

In architecture, there is architectural text, drawing and narrative; the building is the material manifestation of all these in space. There are texts about architecture and cases where architecture is treated as text, either by following a geometric distribution of numbers which have a similar value to that of letters in the text as in the writings of the architectural theorists Rudolf Wittkower (1901–71) and G.L. Hersey,[2] or by approaching the whole design process as if they were writing a text as in the case of architect Daniel Libeskind (b. 1945).[3] The narrative in architecture is encountered either as ornamentation that unfolds a story or as a design process by which the building is meant to, in Libeskind's words, 'tell a story' and be experienced as one.[4] In this dissertation I aim to study the geometric distribution of letters, words or concepts on the page of the book (the space of the text), their experience and their relations to architecture, and then examine architecture as a geometric text or narrative under constraint.

[2] According to G.L. Hersey, '[Wittkower] established the importance of numerical proportion in the design of buildings' using examples of Renaissance writings, drawings and buildings and comparing them to musical harmonic composition. Hersey, researching the influences of the Pythagoreans on Renaissance architecture, claimed that numbers are 'not abstract quantities' but are treated as qualities with 'fixed or predictable geometrical, moral and even personal natures'. George L. Hersey, *Pythagorean Palaces: Magic and Architecture in the Italian Renaissance* (Ithaca and London: Cornell University Press, 1976), pp. 7–8.

[3] For example see his project *Three Lessons in Architecture* (1985). Daniel Libeskind, *Countersign*, *Architectural Monographs, 0141–2191; No. 16* (London: Academy Editions, 1991).

[4] For example Libeskind's, description of the Jewish Museum he designed in Berlin. Daniel Libeskind, *Jewish Museum Berlin* (Munich, London and New York: Prestel Verlag, 1999), p. 60.

For the transition from spatial geometric texts and narratives in literature to spaces as geometric literary texts or narratives I am going to use the conceptual distinction between *Spatial Palindromes* and *Palindromic Spaces*. I will examine Spatial Palindromes as the intrinsic spatial structures of texts and their relation to architecture, and Palindromic Spaces as the actual experience of space in text and architecture. Spatial Palindromes will construct a history of the spatial qualities of palindromes by looking at the theory behind texts and architecture, while Palindromic Spaces will examine the nature of texts' and architectures' spatial experience.

According to the semiotician Erika Greber, who has done significant work on the palindrome's linguistic and theoretical framework, 'the palindrome epitomizes the spatiality of language and scripture'.[5] Some main questions for this research are in what ways the palindrome is considered to be 'spatial' and how it operates spatially in literature and architecture. My intention is to answer by first examining theories about text and space from antiquity and the medieval period to present post-structural linguistics; in other words, to theorise and contextualise the relation between text and space, using the paradigm of the palindrome. Afterwards, I will examine how the palindrome relates to architecture and architectural space, built and written, by looking at examples from literature, poetry and architecture.

At first glance geometry – or, in this particular case, palindromic symmetry – facilitates an opening-up of both text and architecture to the issues of spatiality and space. Symmetry has the ability to relate the construction of meaning in any discipline to an abstract, geometrical manipulation of the material elements of language or of each language's elements. Symmetry is the palindrome's most obvious spatial characteristic, which makes an opening to a kind of temporal and motional, spatial

[5] Erika Greber, *Palindrome Semiotics. A Chronotope of Revolution: The Palindrome from the Perspective of Cultural Semiotics* (accessed 4 May 2005); available from http://www.realchange.org/pal/semiotic.htm.

experience contained within its structure. This experience is related not only to how space is produced and perceived as a visual representation in text or architecture but also to how the 'reader' of a book or a building inhabits space physically (experiences space with the senses in relation to a linear time) and mentally (experiences space through memory and recollection in a non-linear time). The specific geometry of the palindrome links two kinds of space, one outside and one inside, one material and one mental, one visible and one invisible. Probing this link is the main objective of this research. The palindrome is one of language's geometric devices with clear and easily recognisable spatial characteristics. Therefore, examining how the palindrome is experienced in the text will help us to understand similar phenomena and experiences in architecture and, furthermore, how geometry becomes part of the way we inhabit, remember and design space.

The French poet and philosopher Paul Valéry (1871–1945), gives a description of the relation between the mathematics of space and the perception and recollection of spatial events and images. His book *Eupalinos or the architect*[6] (1921), which is going to be discussed later, gives an example of a small Greek temple where the architect has geometrically translated into space the 'mathematical image' of love as the proportions of a beautiful girl from Corinth. The visitor entering the temple, although unaware of the intention and action of the architect, experiences similar feelings to those the architect felt. The individual 'reader' of architecture translates the invisible geometry of space implanted by the architect into a similar erotic experience. In this example, according to Valéry, space 'vaguely awakens a memory which cannot reach its goal; and this beginning of an image of which you

[6] Paul Ambroise Toussaint Jules Valéry, *Eupalinos or the Architect*, trans. William Mc Causland Stewart (London: Oxford University Press, 1932), p. 44.

possess the perfection does not fail to incite and confound the soul'.[7] In this case the temple stands as an image of love, not an image of the girl the architect loved, but it still manages to transfer an experience similar to the architect's. Image, its geometry and spatial distribution, becomes the agent of experience – not of the same experience, of the specific girl, but of a similar one that 'vaguely awakens a memory'. Valéry believes that mathematics and geometry expressed in forms and images anchor experience in space.

In language during different periods and theories, this invisible experiential element of space, presumed by Valéry, is in some way contained in the geometry of words and text. In ancient Greece, the Pythagoreans made the first attempt to describe the world (universe) with relation to an abstract, invisible system founded on language, mathematics and geometry; this marked an important shift in western thought, which until then was based on mythology or the visible elements, earth, fire, water and air. In medieval mnemonics the text was arranged and experienced geometrically both inside the book and within the orator's memory. In modern structuralism, the linguist Ferdinand de Saussure (1857–1913) treated language as an individual system, but one that was still based on letters', languages' or texts' image and the geometry (signifier) of which contained meaning, memory and human culture (signified). Structural linguists like Saussure and post-structural ones like Jean Baudrillard (1929–2007) investigated this particular sign-system, comprising the materiality of the object of language (signifier) and its meaning (signifier). Anagrams, in the theories of Saussure and Baudrillard, and constraints, as they were expressed in literature by OuLiPo or Georges Perec (1936–82), have been used to break the linearity of language and meaning, making an opening to a new space of

[7] Ibid., pp. 21–22.

experimentation. According to Baudrillard, this space – which from now on will be referred to as 'poetic space' – hidden or revealed by the 'poetic form' and manifested by the anagram and the palindrome, is where the solid structure of language is 'exterminated':[8] the space of a 'retroactive form of history', based on the 'reinterpretation of a recollection through the filter of an ever moving present';[9] a 'reversion of history' which characterises contemporary social, cultural phenomena and generates a spatial experience 'that incorporates the recession of outcomes *ad infinitum*'.[10] This self-generated, self-consumed or self-reflective conception of history and space I aim to explore in architecture using the palindrome.

[8] For more information on anagrammatic poetic form and the space it generates: Jean Baudrillard, 'The Extermination of the Name of God', in *Symbolic Exchange and Death* (London: Sage, 2002), pp. 195–243.
[9] Jean Baudrillard, *Reversion of History* (Galilee, 1992 [accessed 11 February 2006]); available from http://www.egs.edu/faculty/baudrillard/baudrillard-reversion-of-history.html.
[10] Jean Baudrillard, *Hystericizing the Millennium* (Galilee, 1992 [accessed 11 February 2006]); available from http://egs.edu/faculty/baudrillard/baudrillard-hystericizing-the-millennium.html.

Definition of the Palindrome

> Likewise, the mirror metaphor has been applied to palindrome structures. Largely a visual phenomenon, the palindrome epitomizes the spatiality of language and scripture, something indicated already on the metaphorical plane of classical terminology: 'running back again' (palindromos), 'stepping back' (versus retrogrades) – a temporal motion in space. Allowing for reversibility of the linear discourse, the palindrome represents the very idea of transformation and metamorphosis. Palindromic reversion is a device for breaking up the linearity of speech and, by implication, the irreversibility of time.[11]

As Greber states above, the palindrome consists of a phenomenon, which although it has language and scripture as its starting point characterises also 'structures' from many other disciplines such as mathematics, biology, chemistry, music, painting and computational theory. As a 'phenomenon', the palindrome can be described mainly by its visual, temporal and spatial qualities, and to do so is my aim in this section.

It is important to analyse these qualities and define how they will be used in this dissertation. This will help to identify where and how palindromes are embedded in different structures, with what meaning, and then to investigate their spatial and architectural expressions. A definition of the palindrome aims neither to create a history as in *Palindromic Spaces,* nor to examine the nature of palindrome's spatial experience as in *Spatial Palindromes*; instead it is a point of reference for both and acts as their reflective surface.

Valéry, in his imaginary dialogue between Socrates and the Phaedrus about the architect Eupalinos, defines which figures can be considered to be geometrical and how they relate to architecture and the experience of space:

> SOCRATES
> **I call 'geometric' those figures which are records of the movements we can express in few words.**
> […]

[11] Greber, *Palindrome Semiotics*.

> This, dear Phaedrus, is the most important point: **No geometry without the word. Without it figures are accidents, and neither make manifest nor serve the power of the mind**. By it, the movements which beget figures being reduced to acts, and these acts clearly designated by words, each figure is a proposition that can be combined with others; and we are able in this way, without paying any more heed to sight or movement, to recognize the properties of the combinations we have made; and as it were, **to construct or enrich space, by means of well linked sentences**.
> […]
> For a time he [the geometer][12] gets away from images, and yields blindly to the destiny imposed on words by the **machinery of the mind**.[13] [emphasis added]

This quote suggests that palindromes from the field of poetry can be considered 'geometric figures', in the sense that they are 'records of movement' that can be expressed in 'few words'. In fact, palindromes, as literary and geometric devices, utilise the minimum of words possible and follow an economy in writing that does not allow for any left-over linguistic material. Every letter in palindromes is not only used but also re-used, and both the writer and the reader have to consider not only the past or present time of the poem or text but also its future and every element's and every thought's reappearance within it. The writer and reader of palindromes have to 'look' forwards and backwards, in every moment of writing and reading, and think of the past and future of the palindrome. This is how a non-linear geometric narrative like a palindrome reveals a non-linear perception of space and time. Such an organisation of figures by geometry as is found in palindromes serves the 'machinery of the mind'. Even if we are not always aware of what we have seen or enacted by reading, our memory opens to the procedures of interpretation, which becomes a spatial temporal practice; this is possibly the reason why Greber employs the term 'chronotope' to describe the motion or 'revolution' of the palindrome's

[12] For Valéry the geometer could be both the poet and the architect.
[13] Valéry, *Eupalinos or the Architect*, p. 45.

operation.[14] In palindromes, figures already contain movement – according to Valéry, 'an action determined by words' – and, even when they are not immediately perceived by the sight, our memory opens to recognise their motion. Well-linked sentences have this ability to enrich or even construct space: the space of the text, the space of memory, or the space as a dwelling. Valéry suggests that space has to be invested by the invisible movement of words and that this is what creates its enjoyment. Poetry and architecture should share the same geometrical values and both affect memory similarly. Palindromes, as geometrical illustrations of poetry, create an experience that I aim to explore in writing and in architecture.

In order to create a definition of the palindrome that will identify and analyse palindromes both in literature and in architecture, I will classify palindromic values in three main categories: mirrored symmetry, reversibility and the cancellation of meaning. I have deliberately kept this threefold arrangement, not only for reasons of economy but also because it relates to the palindrome's tripartite structure (it has a centre of balance around which it can move forward or backward). Mirrored symmetry has to do mostly with the palindrome's geometrical and visual qualities; reversibility with its motional/temporal ones; and the cancellation of meaning with its semantic or symbolic attributes. These three values are interrelated, one existing within another, but the intention of separating them is to help recognise palindromic features when and where we find them; most of the time they are well veiled within the form, or behind the surface/mask of poetic or architectural structures.

[14] Greber, *Palindrome Semiotics*.

Mirrored Symmetry

This is the palindrome's most obvious spatial characteristic and the value that provides it with its spatial geometrical features. Mirrored symmetry is a result of the palindrome's particular structure, which uses words, meanings, but mostly letters as the basis of its construction. When creating a palindrome, the writer must exploit features that usually are not taken into consideration, such as the geometry of the letters and words; this way, writing becomes a different process that confronts the author with the breaking up of conventional procedures and demands the de-construction of linguistic symbols as well as their re-construction in a way in which their form plays a significant role. Letters and words have to be analysed for their ability to mirror themselves or other words in longer strings. According to mathematician, poet and writer Howard W. Bergerson (b. 1922):

> It [i.e. Mirrored Symmetry] is a law irrelevant to, obstructive to, and unrelated to the entirely different laws of grammar, logic, drama and meaning which govern those utterly different, quasi-living mental things called meanings; and it is a law which is indifferent to the collective élan or compulsion of those meanings to orchestrate themselves into unity with the orthographic atoms–so as to become an embodied soul.[15]

A characteristic of the palindrome's structure is that it has a 'double' symmetry or a 'double' reflection: one perceptual/visual reflection of its scriptural elements on the page, that I will call 'horizontal'; and one conceptual/invisible reflection of our memory, that I am going to call 'vertical'. The palindrome's 'horizontal' symmetry is the distribution of elements around a centre of balance on the surface of the page, following the law of mirrored symmetry. The palindrome's 'vertical' symmetry is the way our memory is mobilised in order to decipher its

[15] According to H. Bergerson this quote belongs to 19th century poet Edwin Fitzpatrick. There is little evidence that E. Fitzpatrick ever lived and most likely is a fabrication of H. Bergerson. Howard W. Bergerson, *Palindromes and Anagrams* (New York: Dover Publications, 1973), p. 17.

organisation or to understand the text; we have to visualise the elements of the palindrome and then 'move' forward or back around its structure and meaning. Neither of those symmetries is perfect or accurate as there is always an interruption between the palindrome's elements: between the uniform geometry of the letters in the first case, and the 'void', or distance, between text and reader in the second. Both vertical and horizontal symmetries work together, but their conceptual distinction will assist us in examining how palindromic values operate and how palindromes make an opening to a spatial experience of reading. It will also helps us to examine cases where the mechanism of the palindrome breaks the limits of the page and operates in a third dimension, throughout the whole space of the book – as, for example, we will analyse later in Stéphane Mallarmé's (1842–98) poem-book *Un coup de Dés* (A Throw of the Dice).

In the palindrome's horizontal symmetry there is always a centre of balance, a mirror surface, which has the ability to reflect its distinct elements. This might be a letter or a void and constitutes the point around which the form and meaning of the text twist, fold and unfold themselves. Everything in palindromic texts is related to this specific point, and both their construction and their reading are tied to it, since readers always have to refer to it in order for the palindrome to reveal its content. The middle point also marks the palindrome's triadic nature both structurally and symbolically: structurally, in the fact that we have the forward/backward movement around a specific point; and symbolically, in the offering/receiving function of meaning around the same point. This idea is also related to the cancellation of meaning which will be discussed later. Let's take as an example the following ancient Greek palindrome, one of the oldest surviving examples, which translates as 'wash your sins not only your face'.

Figure 2 The ancient Greek palindrome, *νίψον ανομήματα μη μόναν όψιν* with axes of symmetry. Produced by author.

The difference between palindromic symmetry and any other mirrored symmetry is that palindromes 'break' through the centre of balance. Every mirror symmetry is palindromic, but not every palindromic symmetry is necessarily mirrored. It is easy to have a reflection of an image but difficult to have an image that moves freely in both directions, an image that breaks through the mirror and continues to move at the other side of it, as if the mirror was not there. The elements of a palindrome, without reflecting themselves, keep their reflective symmetry, because palindromic symmetry has to do with the position of the letter in the string rather than its form. It is a topographical symmetry in both the material and the mental space palindromes occupy. For example, in the palindromic words EVIL/LIVE the letter E is not a reflection of itself (Ǝ) but it is in the place where it should be expected to be. Mirrored symmetry in palindromes is thus imperfect.

As it concerns vertical symmetry, what the reader perceives or reads in palindromes requires a constant movement and reflection between the physical (external) and the mental (internal) and vice versa. In order to decipher the mechanism of the palindrome the reader has to visualise its distinctive elements and use imagination to examine and verify their mechanism and topographic nature. Palindromes are not always noticeable because they are either hidden or scattered within the poem, text or book, and very often we have to evaluate both their existence and their operation by visualising their place within a textual frame before and after in the past and future of reading.

For understanding the meaning of a palindromic text, the mediation of an imaginative mirror surface is necessary, a centre that bridges the void between the reader's eye and mind, between image and imagination.

Figure 3 The ancient Greek palindrome, *νίψον ανομήματα μη μόναν όψιν* with planes of symmetry. Produced by author.

Because of this double, non-perfect reflection, palindromic symmetry becomes a spatial experience and text acquires a third dimension, similar to but less obvious than a perfect symmetry. The way palindromes reflect the image of our memory creates similarities to the way space is perceived or the way architecture is experienced. This relation will be analysed further in relation to literature produced under constraint by groups like OuLiPo, to the function of mnemonic devices, and to the non-linear narrative patterns in text and architecture.

Reversibility

This value comes as a result of the palindrome's mirror symmetry and has to do with movement and time. Palindromes represent the possibility of motional and temporal freedom inside the phrase or the text; they have the ability of moving in different directions and times, thus reversing the linearity of speech. Consequently, they provide language with a level of liberty.

To read and understand the palindrome the reader has to move freely in one direction (forward/backward), or sometimes two (upwards/downwards), in palindromic grids, or forth and back between the pages of a book – motions that keep the reader always aware of texts' conventional character. Devices with motional independence, such as the palindrome, question the relation between reading and writing, physical and intellectual or external and internal, constantly reminding us that language is not a fixed system and texts' meaning remains in a constant motion of becoming.

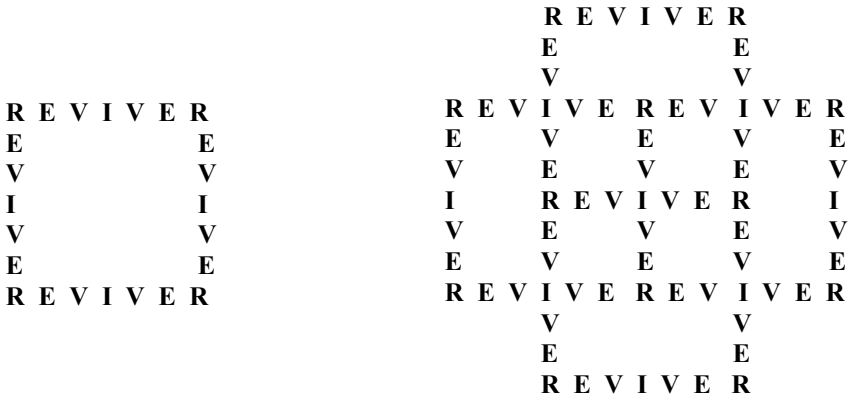


Figure 4 Various types of movement within palindromic grids. From Andrew Belsey, *A Short Treatise on the Art of the Palindrome*, University College of Cardiff, 1984.

Most palindromes, like the above example (fig. 4), can be read in all directions with the same meaning. Some others have a different meaning in the backwards movement (for example, LIVE/EVIL). An example of such a palindromic grid is the following well-known Latin palindrome, which was first depicted in Pompeii's frescoes:

S A T O R

A R E P O

T E N E T

O P E R A

R O T A S

Palindromic grids like the above are not only supposed to increase the magical efficacy of palindromes – this specific one was supposed to be a very powerful incantation – but are also related to the mechanisms of memory, to the procedures of remembering and recollection (mnemonics).[16] Grids are non-linear devices both in the production of literature and in architectural design. In order to explain the origins, use and function of two- or three-dimensional spatial grids, examples of them will be described later in relation to literature under constraint. In general, structures like grids facilitate and guide a movement of imagination within the space they define or occupy.

[16] 'Suggested translations:
The sower Arepo works with the help of the wheel.
Arepo the sower guides the wheels with care.
Arepo the farmer holds the works in motion.
The sower/creator Arepo keeps the world turning.
The creator holds the world […].
Another interpretation suggests that the letters of the square can be re-arranged in the form of a cross, forming the word "paternoster".' Greber, *Palindrome Semiotics*.

One palindromic game is that of orientation/disorientation in a material and mental topography, which is a result of the independence of movement within the palindrome's structure. Orientating yourself in material space presupposes the construction of a mental map or grid, consisting of symbols that take the form of either a map or points of reference (like buildings, streets, landmarks in space or letters in the space of the text); disruption of this mental space creates the feeling of anxiety but also the necessary conditions for creating new organisational patterns.

Palindromes have the ability to create this game of orientation/disorientation by reversing the mental space they produce. The point of orientation is the text's centre of balance around which a reader has to move in order for the palindrome to reveal its structure and meaning; this centre point may also be considered as the point of reference of the text and coincides with the mirrored surface of the palindrome.

The reversibility of time is most related to repetition and the 'reversibility of the linear discourse'.[17] It is not exactly that palindromes have the ability of reversing time but they produce a different perception of time, related to memory, as do other non-linear narratives. In order for a text to reveal its meaning, memory is mobilised. It is the familiar procedure of recalling, comparing and at the same time creating connections between past experiences, knowledge and forethought for the future. Both memory and imagination have the ability of travelling forward and backward in time and, by enabling the reversion of temporal linearity, palindromes create and provoke a perception of time similar to that of the dream.

According to historian, writer and philosopher Mircea Eliade (1907–86):

> Thus the reality and the enduringness of a construction are assured not only by the transformation of profane space into a transcendent space (the center) but also by the transformation of concrete time into mythical time.[18]

[17] Ibid.
[18] Mircea Eliade, *The Myth of the Eternal Return: Cosmos and History*, trans. William R. Trask (London: Arkana, 1989), p. 21.

Hence, the palindrome has the ability, in its reversible procedure, to make a projection into 'mythical time': it is in this time that repetition creates the myth.[19] Palindromic reversibility breaks language's linear or historical perception of time, illustrating the 'cosmogonic act' of creation. According to Eliade: 'A periodic regeneration of time presupposes, in more or less explicit form and especially in the historical civilisations, a new Creation, that is, a repetition of the cosmogonic act.'[20] This 'mythical time' is the time of language's creation; and in language, as an expression of culture, civilisation and ideas, palindromes come to signify a reversion to its original condition of creation and myth. This is possibly why, until recently, the palindrome has had a strong religious and mythical character. In its material form of duality, the palindrome embodies the abolishment of contraries, of good and evil, Gods and Demons,[21] history and myth. This is why palindromes are found in churches and on containers of holy water as well as being attributed to the Devil himself.

Another concept that helps to understand the value of repetition of time is Friedrich Nietzsche's (1844–1900) thought of the eternal return of the Same:[22]

> Observe this moment! From this **gateway**, moment, a long, eternal lane runs backward: behind us lies an eternity. Must not whatever can run its course of all things have already run along that lane before? Must not whatever can happen have happened, have been done, have passed by before – what do you think, dwarf, of this moment? Must not this gateway, too, have been there before? And are not all things knotted together so firmly that this moment draws after it all that is to come? Therefore – itself too? For whatever can run

[19] A beautiful example of this idea is Georges Perec's text *Le Grande Palindrome,* where the reader is confronted by many mythical creatures and heroes.
[20] Eliade, *The Myth of the Eternal Return. Cosmos and History*, p. 22.
[21] According to Eliade: 'On the level of presystematic thought, the mystery of totality embodies man's endeavor to reach a perspective in which the contraries are abolished, the Spirit of Evil reveals itself as a stimulant of Good, and Demons appear as the night aspect of the Gods.' W.C. Beane, ed., *Myths, Rites and Symbols: A Mircea Eliade Reader* (New York: Harper and Row, 1976), p. 440.
[22] Nietzsche's idea of the Eternal Return of the Same has little in common with Mircea Eliade's book *The Myth of the Eternal Return.* The first is a philosophical concept that gives an insight into the notion of 'reversibility of time' and the latter is a history of religions development, used here to investigate the palindrome's relation to 'mythical time' and its religious character. In both cases, however, there is an attempt to break the linearity of structures like time or expressions of time as found in history or myth.

> its course of all things – also into this long lane outward, too – it must run it once more! And this slow spider which crawls in the moonlight, and this moonlight itself, and I and you in the gateway, whispering together, whispering of eternal things – must not all of us have been there before? And return and run in that other lane before us, in that long dreadful lane – must we not eternally return? [emphasis added][23]

In the above passage it is striking that time, or 'moment', is compared to a gateway – palindromes are often spatially related to thresholds in art – and 'this gateway has two faces one toward the long lane continuing backward for an eternity (the past), the other toward the long lane continuing "outward" for an eternity (the future)'. In this passage, time unfolds as a sequence of moments or images forwards and backwards, linked or woven together in all possible and unpredictable configurations like the knots of a spider's three-dimensional web. In order to describe a temporal value, 'moment', Nietzsche uses a spatial or architectural feature, the gateway, and this moment stands in the centre reflecting time in two different directions, reminding us of the centre point of balance of palindromes. And this 'spider which crawls in the moonlight' reminds us of history which recurs again and again, reflecting the point of reference, to the gateway from where we face future and past.

If time is infinite and the universe is a combination of forces and matter, in this infinity of time there are infinite possibilities for the same combination to recur again and again, endlessly forwards or backwards, in the future or past. In palindromes the arrangement of elements represents exactly the above idea: they gain freedom from linear movement yet their meaning remains the same, illustrating the 'eternal recurrence of the Same'.

If Nietzsche refers to the idea of the reversibility of time, or the recurrence of the Same, Baudrillard specifically develops the idea of history's reversibility.

---

[23] Joan Stambaugh, *Nietzsche's Thought of Eternal Return* (Baltimore and London: The John Hopkins Press, 1972), p. 38.

Baudrillard, referring to linear notions of history which are no longer able to characterise or criticise social phenomena at the turn of the twentieth century, talks about a 'retroactive form of history'. This 'reversion of history'[24] is a non-linear history which has the ability to move in multiple directions 'in loops and curls, in tropes, in inversion of meaning'. Baudrillard turns to 'poetic form' in the anagram and, more particularly, to 'poetic reversibility' to provide an insight into such a history as well as to suggest how to deal with the events and periods it outlines and analyses. Baudrillard suggests that the palindrome provides an important tool to 'serve in this time of retroversion of history' and he uses the word 'palindromology' to introduce a rhetoric method, a kind of lecture that could express his concept:

> Are there social spoonerisms, an anagrammatic history (where meaning is dismembered and dispersed to the four winds of the earth, like the name of god in the anagram), rhyming forms of political action, events that can take on either this or that meaning? **The palindrome** [A word, verse or sentence that reads the same backwards as forwards. Ex.: HannaH.], this poetic and rigorous figure of palinode [recantations] would do well to serve in this time of retroversion of history with a burning lecture (perhaps Paul Virilio's dromology could eventually be replaced with a **palindromology**?).[25] [emphasis added]

But how is palindromic motional and temporal movement meant to create a tool for the conception of space, history or architecture? A possible answer lies in the third palindromic value: the Cancellation of Meaning.

[24] 'Could it be that deep down there may have never been a linear unfolding of history, there may have never been a linear unfolding of language? Everything moves in loops and curls, in tropes, in inversion of meaning, except for numeric and artificial languages which, for this very reason, have neither of these...' Baudrillard, *Hystericizing the Millennium*.
[25] Ibid.

Cancellation of Meaning

> One way or another, enjoyment is inseparable not from amassing the Same, reinforcing meaning by addition of the Same, but quite the contrary, from its cancellation by the double, by its cycle of the anti-vowel or the anti-gram where the phonematic character comes to be cancelled as if in a mirror.[26]

The mirrored symmetry of palindromes invokes destruction and death through endless reflections on their mirrored surface, the centre of balance where palindromes contort, moving in different directions without being able to escape. It is like the death of the image mirrored to infinity when an object is placed between two mirrors, reflecting reality and all its possible interpretations, or like the consumption of Narcissus by his own image reflected on the surface of the water. But this procedure (of death) is also the necessary condition for regeneration and 'rebirth' or recurrence in a different form.

Palindromes evoke the narcissistic character of language, and this is possibly the reason why they are historically related to water and placed on fountains mirroring themselves. Most of the time Narcissus is depicted in art at the very moment before transformation, the moment just before he is drawn or drowned by his reflection (fig. 5). Similarly the palindrome is placed in fountains which reflect its elements on the water, at the moment just before the consumption of form or cancellation of meaning.

An ancient Roman palindrome describing the actions of moths at night – their tendency to be consumed by their inclination for flames – sums up these ideas about cancellation of meaning, consumption and rebirth.[27] In this example, too, poetic form and content are combined to express the same value of cancellation:

---

[26] Jean Baudrillard, 'The Extermination of the Name of God', in *Symbolic Exchange and Death* (London: Sage, 1993), p. 199.

[27] It is interesting to note here that in the Greek tradition moths symbolise souls and often share the same name (ψυχές, psyches).

IN GIRUM IMUS NOCTE ET CONSUMIMUR IGNI
(We enter the circle after dark and are consumed by fire)[28]

Figure 5 Caravaggio, *Narcissus*. Galleria Nazionale d'Arte Antica, Rome, 1598–99.

Philosopher Giordano Bruno (1548–1600) summarises the idea of cancellation of meaning when, in his *Heroic Enthusiasts (Gli Eroici Furori,* 1585), gives an interpretation of the above palindrome. In the description of one of his emblems in the fifth dialogue (part IV) Bruno uses the 'image' of the butterfly that flies in circles around the flame to portray 'the enthusiast' or the one who seeks to approach knowledge. Bruno's emblems are intentionally not drawn images and he provides no illustrations in his book, but instead he creates his images by employing words, poetic descriptions and poetic forms, like the following palindrome-emblem '*Hostis non Hostis*'.[29] Bruno continues with the description of his emblem:

[28] Bill Bryson, *Mother Tongue: English and How It Got This Way* (London: Penguin, 1991), p. 227.
[29] **hostis** -is c. [a stranger]; but esp. [an enemy, foe, opponent]
translation from the on-line dictionary of University of Notre Dame.

> TANS. The meaning of the butterfly is not difficult, which, seduced by the fascinations of splendour, goes innocently and amicably to meet its death in the devouring flames. Thus, 'hostis' stands written for the effect of the fire; 'non hostis' for the inclination of the fly. 'Hostis', the flame passively; 'non hostis', actively. 'Hostis', the flame, through its ardour; 'non Hostis', through its splendour …
> Here in the figure he shows the resemblance between the enthusiast and the butterfly attracted towards the light; in the sonnet, however, he demonstrates rather difference and dissimilarity…[30]

Both in the emblem and in the description of it, the 'enthusiast' who is seeking the 'light' or enlightenment has to die, to be consumed by fire. In the palindromic emblem-image Bruno highlights the enthusiast's similarity to the butterfly: both are driven towards the light by their desire or inclination towards the flames. In the sonnet that follows Bruno describes and analyses the palindromic emblem highlighting the 'dissimilarity' or 'difference' between the enthusiast and the butterfly. This 'difference' is that, although both the enthusiast and the butterfly are conscious of their dreadful fate, only the 'enthusiast' is aware that he will remain the same. Obviously Bruno is not referring to physical death and rebirth but mainly to a procedure of memory. In order to reach divine knowledge, 'the enthusiast' has to be purified and cleansed by all the residues of the mind; thus he has to forget, and that is why he has to accept the action of the flames, knowing at the same time that he will be reborn, or that his mind will be ready for the new memory. Death is described as a procedure of rebirth in circles, as in the case of Phoenix, as in the end the enthusiast will remain the same. It is like saying that every time we want to learn something new we have to forget everything old, or approach knowledge always with a free open mind, without preconceptions.

It is noteworthy that two of the most ancient palindromes from the Greek and Latin languages are related, the first, 'νίψον ανομήματα μη μόναν όψιν', to the water

http://www.nd.edu/~archives/latgramm.htm (accessed 4 June 2005).

[30] Fifth dialogue part IV, from Giordano Bruno, *The Heroic Enthusiasts (Gli Eroici Furori): an Ethical Poem, Part the First*, trans. L. Williams (London: George Redway, 1887), pp. 128–30.

and the second, 'in girum imus nocte et consumimur igni', to the fire. As opposite elements that share the symbolic meaning of purification and cleansing, death and rebirth in recurrent circles (the myths of Narcissus and of the Phoenix), both relate to memory and oblivion. Possibly this is the reason why palindromes, together with other letter permutations, have often been dedicated to deceased people: for example, books dedicated to emperors or transcriptions on graves. A palindromic epitaph in the churchyard of St Gunwalloe in Cornwall reads:

> Shall we all die
> We shall die all
> All die shall we
> Die all we shall.[31]

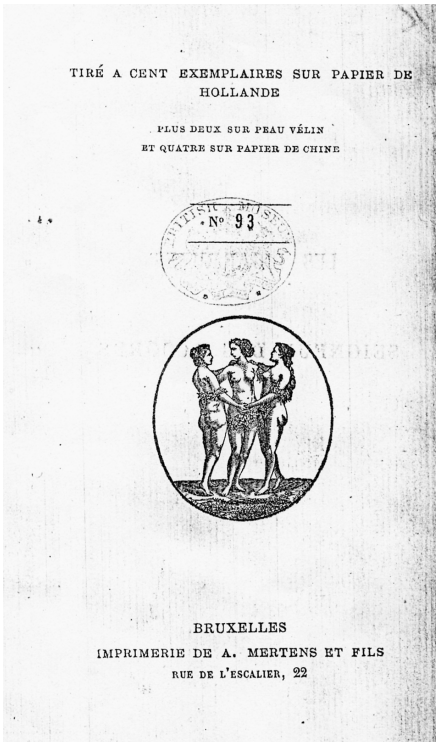
Perhaps that is also why palindromes were related to the Muses (or Graces): because they have the power to clear the mind in order for the Muses to bring their gifts of inspiration and creation. We often find representations of the Muses and Graces in editions about anagrams, and palindromes are frequently dedicated to them (fig. 6).[32]

The perception of palindromes is similar to the procedures of memory and its motion in space, independent of time; they interact with the dreaming mind as they are free to create new interactions between the signs and their meaning. As in dreams, the way our memory operates in palindromes is not linear. This may also be the reason why they were considered to be mnemonic devices. The free rearrangement of elements in one's mind is a procedure of altering the combinations already accepted as valid and creating new ones; different, but also the same.

> Letter permutation is an operation presupposing the cutting up of the whole word into parts, it is an operation in the surgical sense. And dismemberment of the word is prefigured, as Vladimir Toporov has postulated in carrying on Ferdinand De Saussure's anagram theory, in the sacral act of the priest dismembering the sacrificial creature. By anagrammatic dismembering and

[31] Tony Augarde, *The Oxford Guide to Word Games*, 2nd ed. (Oxford and New York: Oxford University Press, 2003), p. 117.
[32] For instance, see: Estienne Tabourot, *Les Bigarrures du Seigneur des Accords – Les Apophtegmes du Sieur Gaulard – Les Escraignes Dijonnoises; Tome Premier* (Bruxelles: A. Mertens et fils, 1866).

> dissemination of the divine name(s) into the sounds and letters of poetic speech, the priest-poet and primeval grammarian imitated symbolically the dismemberment of the body and the rearrangement of the parts on the sacrificial altar … Letter permutation is an operation in the surgical sense.[33]


TIRÉ A CENT EXEMPLAIRES SUR PAPIER DE HOLLANDE

PLUS DEUX SUR PEAU VÉLIN
ET QUATRE SUR PAPIER DE CHINE

N° 93

BRUXELLES
IMPRIMERIE DE A. MERTENS ET FILS
RUE DE L'ESCALIER, 22

Figure 6 First page of an edition about anagrams. From Tabourot, Estienne. *Les Bigarrures*, *Tome Premier*. Bruxelles, 1866.

This procedure of violating language through formal manipulation makes an opening to poetic space,[34] the space veiled in the non-linear relation between sign and signifier inside the anagram. Words do not mean only what they suggest with their materiality. According to Baudrillard: 'The poetic anagram cuts across the two laws of the human word, as proclaimed by Saussure, that of the codified bond between the

[33] Greber, *Palindrome Semiotics*.
[34] 'To name it more precisely, using a word that has come to have great currency in recent literary studies, the formal approach constitutes a "poetics".' Anthony Matthew Mellors, 'Poetic Space and the Late Modernist Text: The Theory and Context of J.H. Prynne's Writings from 1960–1974' (PhD thesis, University of Oxford, 1992).

signified and its signifier and that of the linearity of signifiers'[35] This way the palindrome is released to the invisible space of meaning.

Saussure, using examples where poetic structures were hidden in letters or phonemes spelling the names of divinities, commented that the name of God is hidden in anagrammatic structures. Baudrillard, continuing Saussure's linguistic theory, uses the anagram to denote the arbitrariness of the sign-signifier relations, claiming that the anagram is a mechanism for destabilising symbols, dispersing them in an invisible world of a non-linear discourse between cause and effect. Anagrammatic structures are paradigms of how the name of God can be violated and exterminated, scattered within the materiality of language. In history and especially in antiquity, poetic dissimulation has been what art historian Edgar Wind (1900–71) calls the 'enigmatic veil' under which divine knowledge was obscured, and this found expression in architecture with the sculptures of sphinxes in all the Egyptian temples.[36] Like Baudrillard's claim for the anagram, in architecture, the name of God is obscured, scattered or 'exterminated' in such built examples.

In the anagram every single linguistic element and letter utilises the maximum of its material and semantic values, introducing the idea of economy in language.

> Every term or phoneme not taken back, not returned, not volatilised by poetic doubling, not exterminated as a term and as a **value** (in its equivalence to what it 'meant' or 'wanted to say'), remains. It is a residue. It will return to the fantastic sedimentation of waste, of opaque discursive material.[37]

Palindromes have also been characterised by this economy in language, as every letter, word, phoneme, is used, providing all of its values and qualities.

---

[35] Saussure quoted in Baudrillard, 'The Extermination of the Name of God', p. 197.
[36] 'Divine subjects and the secret Mysteries must not be rashly divulged … That is why the Egyptians had sculptures of sphinx in all their temples, to indicate that divine knowledge, if committed to writing at all, must be covered with enigmatic veils and poetic dissimulation …' Edgar Wind, *Pagan Mysteries in the Renaissance* (London: Faber and Faber, 1968), p.17.
[37] Baudrillard, 'The Extermination of the Name of God', p. 202.

Palindrome in History

There has been little systematic research into the history of the anagram or the palindrome. Academic books on the palindrome are limited and come from different eras and languages; examples include *Les Bigarrures* (first edition 1588), Peter Conway's *The Palindrome* (1951) and Bergerson's *Palindromes and Anagrams* (1973).[38] Tony Augarde, an authority on word games and word play,[39] gives a short description and historical review of all kinds of letter permutations including palindromes. There are also popular collections of palindromes with illustrations, which treat them as word games or curiosities of language.[40] There are many websites dedicated to palindromes[41] and internet sources such as *Palindromist* website[42] (an extension of the *Palindromist* magazine) dedicated exclusively to palindrome enthusiasts. These circles feature competitions, such as 'write the longest palindrome'. In short, although there are a very large number of palindrome devotees, few have seriously researched their history.

In his *History of the Lipogram* (1970), Perec notes that anagrams have been overlooked in dictionaries and respectful editions of literary history. As word games, they are not considered as important as other forms of literature and writing. According to Perec:

> This lexicographical ignorance is accompanied by a critical misappreciation as tenacious as it is contemptuous. Exclusively preoccupied with its great capitals (Work, Style, Inspiration, World-Vision, Fundamental Options, Genius, Creation, etc.), literary history seems deliberately to ignore **writing as practice, as work, as play**. Systematic artifices, formal mannerisms (that

[38] Bergerson, *Palindromes and Anagrams*; Peter Conway, *The Palindrome* (London: Andrew Dakers Limited, 1951); and Estienne Tabourot.
[39] Augarde, *The Oxford Guide to Word Games*.
[40] For a typical example see: *Madam I'm Adam: A Book of Palindromes from Walker Izard* (London: Walker Izard, 1991).
[41] A Google search on the word 'palindrome' reveals 883,000 hits (search made on 9 December 2008).
[42] *The Palindromist: A Journal For People Who WRITE – and Read – Palindromes.* http://www.realchange.org/pal/index2.htm (accessed 4 August 2005).

> which, in the final analysis, constitutes Rabelais, Sterne, Roussel …) are relegated to the registers of asylums for literary madmen, the 'Curiosities': 'Amusing Library', 'Treasury of Singularities', 'Philological Entertainments', 'Literary Frivolities', compilations of a maniacal erudition where rhetorical 'exploits' are described with suspect complaisance, useless exaggeration, and cretinous ignorance. Constraints are treated therein as aberrations, as pathological monstrosities of language and of writing; the works resulting from them are not even worthy to be called 'works': locked away, once and for all and without appeal, and often by their authors themselves, these works, in their prowess and their skilfulness, remain paraliterary monsters justiciable only to a symptomology whose enumeration and classification order a dictionary of literary madness.[43] [emphasis added]

But anagrams, and in particular palindromes, seem to have existed since writing itself, and until the nineteenth and twentieth centuries were considered important poetic compositions. For example, in ancient Greece palindromes were related to Orphic poetry and to the famous poet Sotades (palindromes are also called Sotadic verses). In Byzantium, palindromes were spiritual texts related to religious architecture and often seen in church fountains, as at Agia Sofia in Constantinople and Mount Athos in Greece, and in arches and domes. There are also numerous examples of anagrams, lipograms, pangrams, acrostics, chronograms or palindromes specially composed for kings and collected in beautiful and expensive editions,[44] or in religious texts, such as the Cabala (fig. 7).[45] Examples of how the palindrome has been used in some of the above contexts will be examined later in this dissertation.

---

[43] Georges Perec, 'History of the Lipogram', in *OuLiPo a Primer of Potential Literature*, ed. Warren F. Motte Jr. (Lincoln, NE and London: University of Nebraska Press, 1986), p. 98.

[44] For example, the eighteenth-century pamphlet *Cœlum Orbis Teutonici Excellenti Rursus Luce Sua Nitescens Quando Augustissimus Potentissimus Ac Invictissimus Dom. Dominus Franciscus Stephanus ... 13tia Septembris Electus Romanorum Imperator Semper Augustus (Romanorum Imperator Esset Coronandus). [Verses, Anagrams, Chronograms and Similar Pieces, with Illustrations.]* (Moguntiæ: Per Johann Leonardum Ockel, 1745).

[45] *Kabbala Denudata, Seu Doctrina Hebræorum Transcendentalis Et Metaphysica Atque Theologica: Opus ... In Quo Ante Ipsam Translationem Libri ... Cui Nomen Sohar Tam Veteris, Quam Recentis, Ejusque Tikkunim ... Præmittitur Apparatus*, ed. C. Knorr von Rosenroth, 2 vols., *Zohar* (Francofurti: Sulzbachi, 1677–84).

Figure 7 First pages of the second volume of the Zohar books, possibly the most important Cabalistic text. On the left page there is a *Cancrinis Cancrinus,* a palindromic poem arranged on a square grid. From *Kabbala Denudata*, Francofurti, 1677–84.

But palindromes have also been very powerful incantations.[46] According to a book about magic which is attributed to medieval philosopher and theologian Albertus Magnus (1193–1280), palindromes could be written in various ways in grids and triangles, folded in paper and cloth, and even eaten to:

> … extinguish Fire without the aid of Water …,
> for the fever …,
> an excellent way to Prove wether a Person is a Witch or not …,
> When a Cow has Calved or has the Fever and to prevent that her Milk be taken during that year …,
> An Amulet for the Colic …,
> For Poisonous Air and Pestilence …,
> For all sorts of Sorcery of Man and Beast …[47]

[46] For more information on palindromes' magical tradition see Mare Kõiva, *Palindromes and Letter Formulae: Some Reconsiderations* (accessed 19 July 2003); available from http://www.folklore.ee/Folklore/authors/mare.htm.

[47] Refences to palindromes and especially the ROTAS square could be found in pages 39, 43, 62, 63–64, 91, 96, 98, 101, 143. Magnus Saint Albertus, *Albertus Magnus: Being the Approved, Verified, Sympathetic and Natural Egyptian Secrets; or, White and Black Art for Man and Beast ... Translated from the German, Etc* (New York: 1880).

Possibly it is this connection to religion, mysticism and magic that determined the palindrome's eventual demotion from poetry to linguistic oddity, as lamented so vividly by Perec.

Although recently there has been an interest in palindromes from important writers and thinkers like Perec and Baudrillard, there is still a prejudice about their scientific and poetic value and importance. Most available evidence and information on the palindrome comes from different and dubious sources, and it is very difficult to accurately pin down the origins and understand fully the specific context in which it has been used in poetry, arts and architecture. The main intention of this research is not to create a comprehensive history of anagrams or palindromes, but instead to examine possible spatial relations between poetry and architecture by using the case of the anagram and the palindrome. It would have been much easier to do this if there were already some work on the palindrome upon which to build. Instead a very large part of this research considers why the palindrome is spatial and how it has been used spatially in literature, before it tries to cross through to architecture. My aim is not to 'master' the fields of literature, poetry and linguistics but rather to understand how they relate as well as to identify their links to architecture.

Perec's idea of 'writing as practice, as work, as play', as he describes literature in the *History of the Lipogram*, is also of great interest for architecture because it suggests that the architectural text might be more than an element complementary to design; that is, something that simply describes a project, tells a story behind a project or creates a project as a narrative. Recently there is a growing interest in the direction of writing as 'practice' in architecture and architectural theory, as in the work of architectural critic Jane Rendell who, having as a starting point 'the possibilities

opened up for criticism by art- and site-writing', defines 'architecture-writing' as an interdisciplinary 'critical-spatial practice'. According to Rendell:

> Architecture-writing also demands that we consider the modes in which we write, as well as the medium in which we practice criticism, to be more than a description of content, but to define critical positions …[48]

'Writing as practice', according to Perec, and 'architecture-writing', according to Rendell, bring text into the very heart of the creative architectural process. In this model text could be used as a design tool inviting the designer to take into consideration not only how writing unveils, as Perec claims, 'Work, Style, Inspiration, World-Vision, Fundamental Options, Genius, Creation, etc.', but also how it becomes a 'formal mannerism', or a drawing itself; an architectural text that takes into consideration both text's and architecture's formal values, their ability to create spatial experience and space.

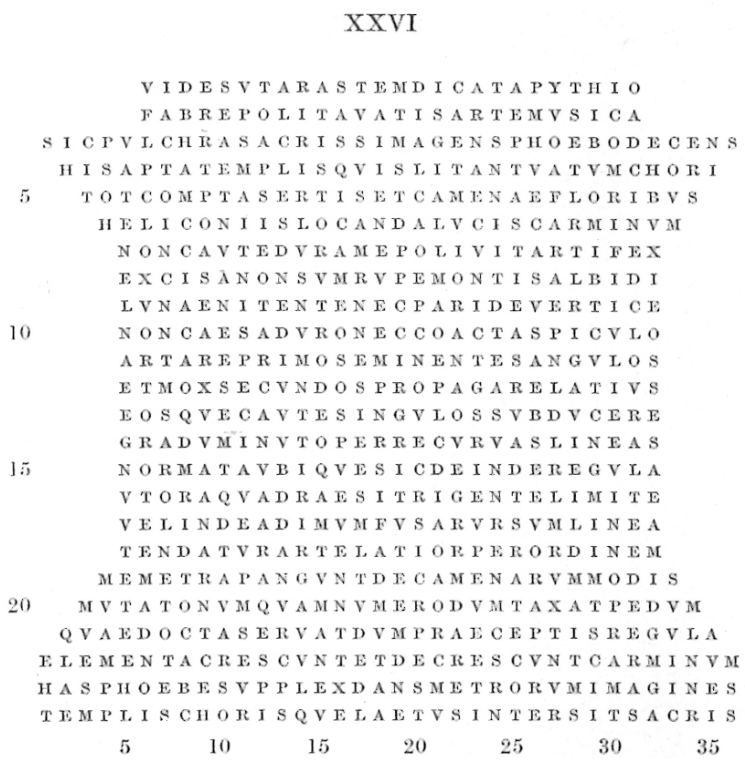


Figure 8 Optatianus poem in the form of an altar. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina,* Torino, 1973.

[48] Jane Rendell, 'Architecture-Writing', *Journal of Architecture* 10, no. 3 (2005): 263.

In the example (fig. 8) from poet Publilius Optatianus Porfirius (fourth century AD), the poem takes the form of an altar.[49] The poem was likely written to be inscribed on an architectural feature but also, as a kind of formal writing, was carefully calculated to share the similar form and principles of the object it was meant to represent and be represented on. Such writing was not meant to be part of an edition, poetry collection or book and was not written to express solely, as Perec noted, 'Work, Style, Inspiration, World Vision, Fundamental Options, Genius, Creation, etc.', but formed as a writing for architecture and as part of an architectural feature. The poem was not treated separately from the object, the altar in this case, but together with the object on which it was written; text became the object (altar) itself.

Such examples of formal writing, a category in which palindromes also belong, demonstrate a form of tradition. This tradition is related not only to literary theory but also to architecture, architectural writing or 'architecture-writing'. These examples of formal writing operate as objects where poems' geometry and materials function together and can be experienced through reading, looking and touching. Some kinds of formal writing were specially composed and carefully calculated for buildings and architectural elements, and it is not coincidental that we find them there. For example, it is not coincidental that when used in architecture palindromes were traditionally placed on thresholds, domes, arches and fountains. In that sense palindromes could be considered very literally as a sort of architectural writing, in that letters shared similar values to the buildings blocks on which they were inscribed: the threshold, the dome, the arch or the fountain itself. This kind of writing that could be expressed spatially in text and textually in architecture, I call 'spatial writing'. Spatial writing includes examples from both text and buildings.

[49] Publilius Optatianus Porphyrius and Giovanni Polara, *Publilii Optatiani Porfyrii Carmina* (Torino: In aedibus Paraviae, 1973).

Throughout this work we will see examples of 'spatial writing' from different periods under the name of either pattern, visual, formal, concrete poetry, combinatory literature or literature under constraint. Very briefly, I will examine this tradition of spatial writing in literary theory under the name of Orphic, Platonic, Latin sign theory, mnemonics, structural and post-structural linguistics, but the main focus will be on how text is treated spatially and architecturally within such a theory. In the examples of spatial writing analysed from literature or poetry, this text-space is organised more like a building-space; it is multi-layered, three-dimensional, temporal, based on movement, and the geometric characteristics of its elements can transfer forces, create bodies and as a result be experienced retrospectively over time, like a building. Such a context explains why, of all literature, types of spatial writing have been widely used as inscriptions written on buildings and architectural features; it is because the meaning of the text, its visual impact and spatial structure combine with the physical elements and spatial structure and work together to create a whole, an object, the building itself. When spatial writing, or in particular a palindrome, is written in a book taking a triangular or cyclical form, it is not only decorative but consists of a spatial structure which shares the same principles with architecture and helps to create and keep together the space of the book. In these examples of spatial writing text and drawing, books and buildings are organised and experienced similarly.

It seems plausible that such examples of spatial writing in poetry and literature were initially composed as objects or 'bodies', closely related to the physical values of the materials as well as to the structures on which they were supposed to be written. Carved on stone or written with metal as architectural features and other objects, their purpose was to create powerful images, signs, which would teach,

convey easily remembered directions or demonstrate something from the external reality of the gods and their divine logic. With the invention of printing, such kinds of spatial writing were categorised and classified in printed works and anthologies, but they carried something from their original material characteristics. Therefore I will argue that spatial writing was used in printed works to transfer something from the solidity, credibility and experience of other objects or 'bodies' to the page or the book. Later, in structural and post-structural linguistics, I will argue that spatial writing was used to express the abstract and material character of language and its ability to be used as an independent system capable of creating its own space: the space of language.

To demonstrate how spatial writing operates, let's examine an example where the practice of writing palindromes becomes an image-poem-book, or in different words a literary object. Through such examples this research aims to examine how a similar act of writing could relate to the architectural object, or to take the opposite direction in the next example and see how an architectural object (or the object of architecture) could become an act of writing. The term palindromic space could refer to both the literary and architectural object and we are going to examine one from each discipline.

Example of Palindromic Space in a Book

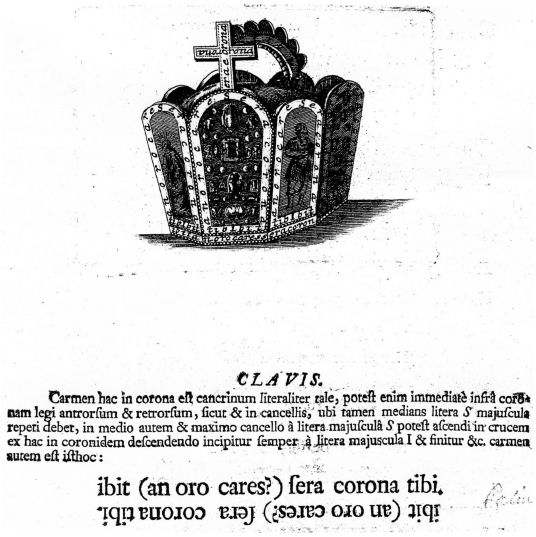
Figure 9 Palindrome in the form of a double-headed eagle. From *Coelum Orbis Teutonici,* 1745.

The image and palindrome (fig. 9) comes from a 1745 pamphlet entitled *Coelum Orbis Teutonici*,[50] which is part of a bigger collection of Latin poems gathered under the general title *Tracts*. This anthology of pamphlets collects poems from 1650 to 1778, a time span of 128 years. The link between them is that they all consist of anagrams, cabalas, chronograms or other types of constraints, either religious or dedicated to important religious figures or rulers. In the pamphlet there are, among other anagrams, seven illustrations of Latin palindromes.

The first image (fig. 9) is the double-headed eagle crowned and holding a sceptre, a sword and an orb. The double-headed eagle was the symbol of the Byzantine Empire: later used by the Russians and popular in the rest of Europe, it is still the symbol of the Christian Orthodox Church. In general the double-headed eagle is a symbol of royalty translated as one body that looks in two different directions. In the case of Byzantium, it symbolised an empire that existed geographically, culturally and politically in between the west (Rome) and the east (Constantinople). Like the eagle, another symbol of the palindrome in the past has been Janus, the Roman god who simultaneously looks in two different directions, east and west; from the beginning to the end of the day.

If we focus mainly on the images and how the poem is structured, the double-headed eagle carries a crown, a sword, a sceptre and an orb, each of which becomes an individual palindromic poem, object or image (fig. 10,11,12,13). In all of the following images, the palindrome is written on the object itself, as well as left to right and mirrored underneath.

[50] On the first page of this anthology there is a small description of the pamphlet as *Coelum Orbis Teutonici. Election of Francis Consort of Maria Theresa, as Emperor 1745. Many curious cabalas, devices, and calculations. 45 Chronograms*, obviously characterised as such much later than the date of their printing, possibly by those who collected and organised the contents of the whole volume.



CLAVIS.

Carmen hac in corona eſt cancrinum literaliter tale, poteſt enim immediatè infrà coro-nam legi antrorſum & retrorſum, ſicut & in cancellis, ubi tamen medians litera S majuſcula repeti debet, in medio autem & maximo cancello à litera majuſculâ S poteſt aſcendi in crucem ex hac in coronidem deſcendendo incipitur ſemper à litera majuscula I & finitur &c. carmen autem eſt iſthoc:

ibit (an oro cares?) fera corona tibi.

Figure 10 Palindrome in the form of the crown. From *Coelum Orbis Teutonici,* 1745.

CLAVIS.

Carmen hîc iterum eſt literaliter cancrinum potéſtque legi vel incipiendo in capulo vel in cuſpide, eſt autem carmen hoc:

Robur ero tibi bis, ſi bibit ore rubor.

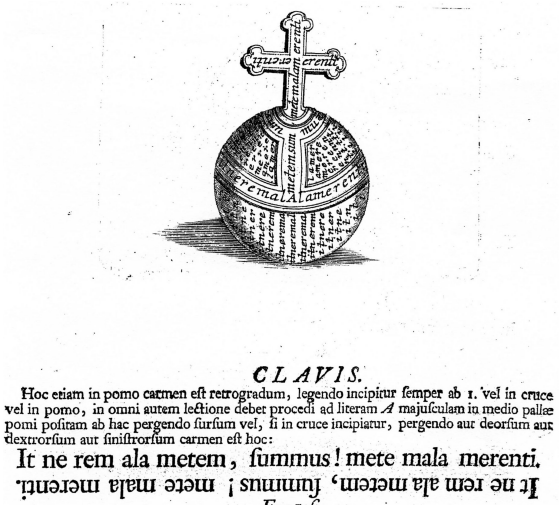
Figure 11 Palindrome in the form of the sword. From *Coelum Orbis Teutonici,* 1745.

CLAVIS.

Carmen eſt cancrinum in hoc ſceptro & lectu facillimum, eſt autem hoc:

Angere re tua reſcis, ſic fera utere, regna.

Figure 12 Palindrome in the form of the sceptre. From *Coelum Orbis Teutonici,* 1745.



CLAVIS.

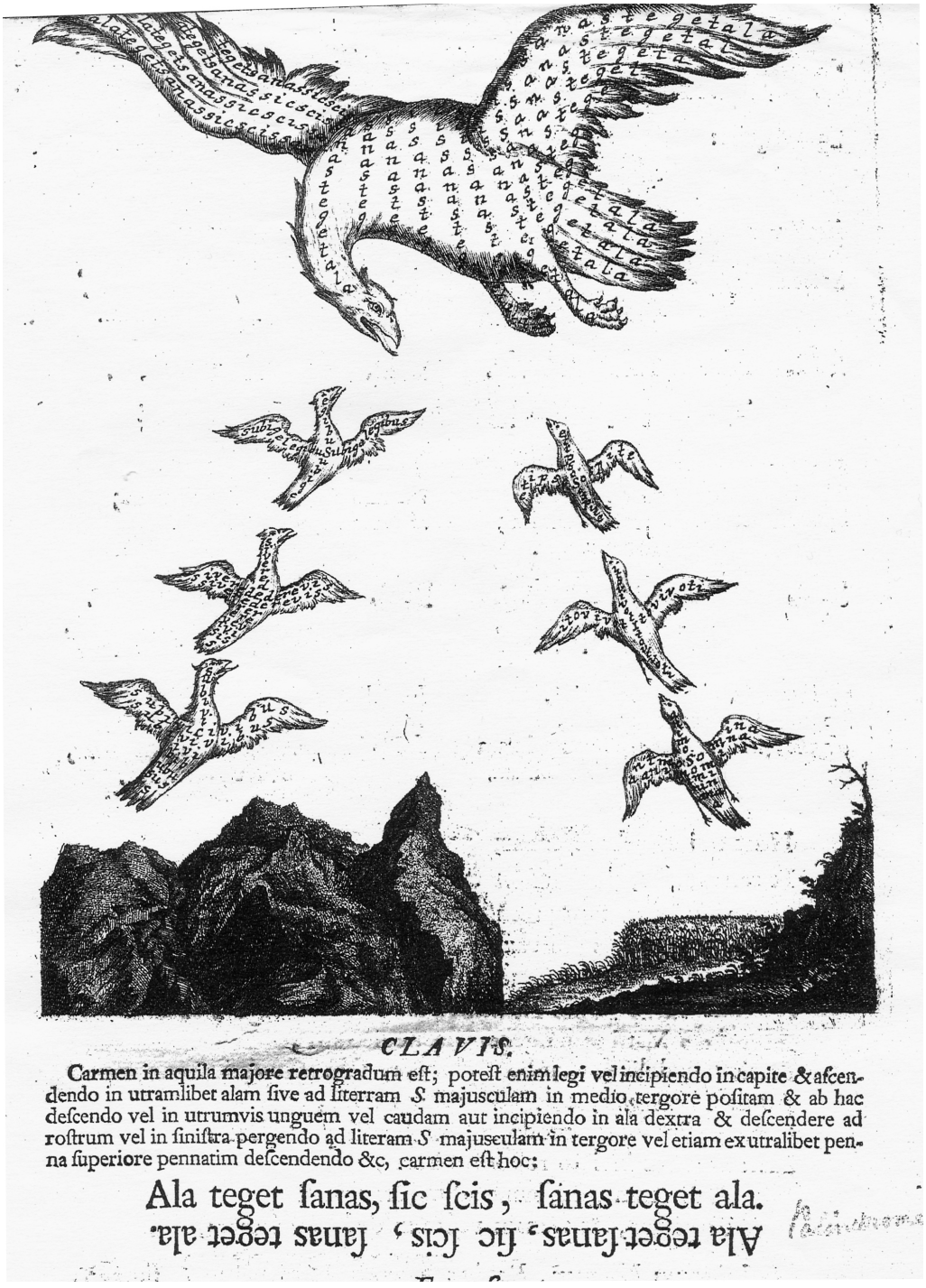
Hoc etiam in pomo carmen eſt retrogradum, legendo incipitur ſemper ab I. vel in cruce vel in pomo, in omni autem lectione debet procedi ad literam A majuſculam in medio pallæ pomi poſitam ab hac pergendo ſurſum vel, ſi in cruce incipiatur, pergendo aut deorſum aut dextrorſum aut ſiniſtrorſum carmen eſt hoc:

It ne rem ala metem, ſummus! mete mala merenti.

Figure 13 Palindrome in the form of the orb. From *Coelum Orbis Teutonici,* 1745.

The anthology starts with the image of the eagle-palindrome that splits in two (fig 9) – one body that looks in two different directions. Afterwards the image breaks into its basic structural elements – the objects-symbols the eagle carries, each of which is in the form of a palindrome (fig. 10,11,12,13). In the next image (fig. 14), all of those elements seem to return to their origins, taking the form of smaller birds-

palindromes that come from two different directions to meet again under one body of one eagle, once more in the form of the palindrome.



CLAVIS.

Carmen in aquila majore retrogradum eſt; poteſt enim legi vel incipiendo in capite & aſcendendo in utramlibet alam ſive ad literram *S* majusculam in medio tergore poſitam & ab hac deſcendo vel in utrumvis unguem vel caudam aut incipiendo in ala dextra & deſcendere ad roſtrum vel in ſiniſtra pergendo ad literam *S* majuſculam in tergore vel etiam ex utralibet penna ſuperiore pennatim deſcendendo &c, carmen eſt hoc:

Ala teget ſanas, ſic ſcis, ſanas teget ala.

Ala teget ſanas, ſic ſcis, ſanas teget ala.

Figure 14 Palindromes in the form of a flock of eagles. From *Coelum Orbis Teutonici,* 1745.

Each image folds into itself and all of them fold into each other. Each palindrome is written on the body of the eagle, sword, sceptre or orb, becoming one with the object itself. All palindromes meet in the middle of each object and unfold in two directions, written in either a line, a triangular form, a curve or a circle. But also the synthesis of all poems as a whole begins from a centre to return again to a centre, as an attempt to keep all the images-palindromes together as a complete concept or as a unified body, in this case the eagle. For example, the centre of the palindrome on the body of the double-headed eagle is the Letter **S** (fig. 15) positioned exactly at the chest of the bird; from there the rest of the letters develop and expand in a triangular form. In the other image of the eagle (fig. 16), the letters of the palindrome are written so that they form a triangle focusing again on the letter **S**. At the bottom of each illustration, the palindrome itself is reflected in its reverse image as in a mirror (fig. 17), which already provides the text with a vertical surface of reading in relation to the page, a mirror surface that cuts through the page and reflects its elements.

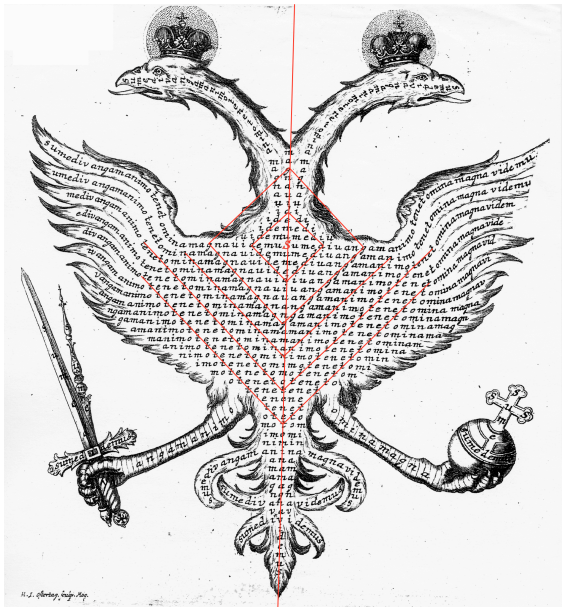


Figure 15 Axes of symmetry and development of letters in the image/palindrome of double-headed eagle. Produced by author.

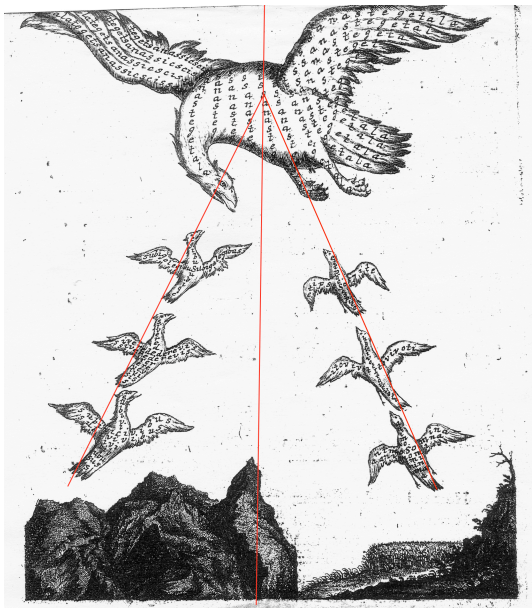


Figure 16 Axes of symmetry and development of letters in the image/palindrome of flock of eagles. Produced by author.

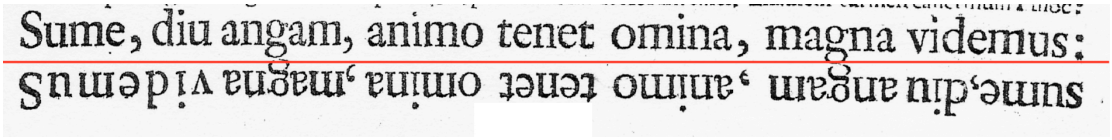


Figure 17 Axes of symmetry and development of letters at each palindrome beneath the images. Produced by author.

At the end all images, from their different directions, come back to meet at the point where they have begun: the body of the eagle or the letter S. This is an easier way to remember the poem than if these images-poems were disassociated, a process that relates to mnemonic techniques in the Middle Ages and Renaissance. Instead of having to remember random poems and images, the reader keeps in mind only one coherent image-poem, for example that of the eagle, but with all its fine details. The reader just has to be careful about where to place these details, how to break them into individual elements and, at the end, how to bring them back together. This way of structuring the pamphlet-poem turns reading into an 'active' process. To re-construct a poem which is experienced in a non-linear way, the reader has to move within the space of the book and memory, forwards and backwards, between the pages, and see, perceive, remember and recollect the letters-images, poems-objects. Consequently reading becomes an operation that involves a movement within the space of the book: first of the eye, which reads the words-images, and then of the mind engaging both memory and imagination to re-combine letters and images as a meaningful whole. The imagined mirror of the palindromes demands that the reader reflect the letters in imagination to read the reversed palindrome. There isn't any mirror there: the reader must imagine one.

The last palindromic image of this pamphlet is one of a dog holding a wheel (fig. 18). The palindrome is written both on the body of the dog and on the wheel. As a concluding image the dog, possibly symbolising fidelity and loyalty, is giving

directions as to how these words and images operate or should be held within the mind; like a wheel or a circle, whatever direction you might take, it returns to itself. The reader, in order to be loyal to the operation of the text and to the meaning of these words, should use them as a wheel, and this should be his or her navigation tool within the images, poems and concepts. But this key or lock for memory possibly refers also to the memory wheels developed by philosopher Ramon Llull (or Raymond Lull) (1232–1315) (fig. 19) and used widely by other philosophers such as Giordano Bruno (1548–1600) and Gottfried Wilhelm Leibniz (1646–1716). Memory wheels are combinational textual machines operating within memory. They were made by concepts, letters or numbers arranged circularly, which could rotate around a centre and create a space of rhetoric comprising multiple combinations of meaning. These memory wheels will be analysed later.

Figure 18 Palindrome in the form of a dog holding a palindromic wheel. From *Coelum Orbis Teutonici,* 1745.

Figure 19 Ramon Llull, memory wheel, 1305-1307. From *Ars generalis ultima (Ars Magna)*, Turnholti,1986.

The aim of this example is not to analyse further the meaning or content of these *Orbis Teuctoni,* (tectonic rings, circles or spheres), but to show how poetic devices, such as the palindrome, can create a spatial experience of reading which moves in more than two dimensions. It is worth noting that we find in literary history and in linguistic studies terms like *Orbis Teuctoni,* architectural mnemonics, concrete poetry, structural linguistics, which all borrow from an architectural language. For an architect, it is fascinating to examine how these terms (teutonic, architectural, concrete, structural) are being used in another discipline. If architectural language is used to describe poetry, and books are organised as spaces, then what kind of relations emerge when architecture uses language or text to organise space?

Example of Palindromic Space in Architecture

Palindromic Rock

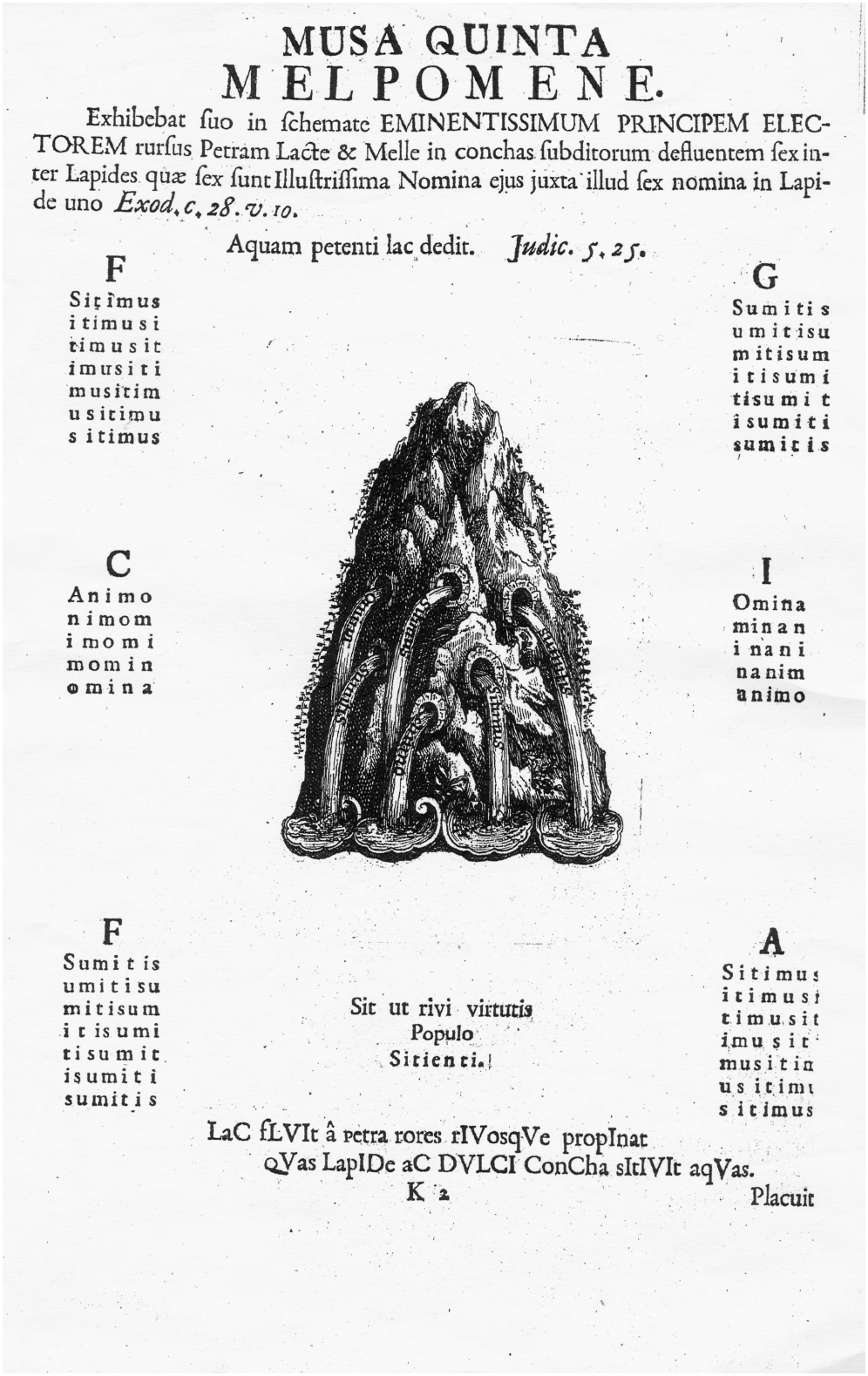


Figure 20 Illustration of spring with palindromes. '… *atlas excelsus on the same subject, many curious devises … chronograms*', 1743.

The example of the fountain (fig. 20) comes from an eighteenth-century edition with anagrams, chronogram, palindromes and cabalistic poetic arrangements[51]. In this case we have the image of a *perennial fountain* from which palindromes emerge like streams of water. And palindromes, like water, have the ability of returning to their origin: to the place where they started, their source. Water becomes steam becomes water again, endlessly running, flowing, in a palindromic movement. These verses possibly were thought of as a spell against the flow of time in nature, or against oblivion in the flow of history.

There are six palindromes coming out of the fountain, or two triads in their eternal movement to perfection mediated by the Muses. This specific example is dedicated to the fifth Muse, Melpomene, the songstress and Muse of Tragedy, often represented holding or wearing a tragic mask. In the same way, the palindrome borrows the form – wears the mask – of water. The idea of the mask as a surface of reality in poetry will be analysed later in relation to Baudelaire and the Parnassians.

On these streams of water are written the palindromic words:

Animo – Omina

Sitimus – Sumitis

These words are placed at the edges of the page in columns that reflect each other. For example, on the right we have the word Animo and on the left the word Omina. In the centre is positioned the image of the rock.

In many ancient ideologies the rock was a symbol of the centre either of the sacred city or of the building, the point were everything starts and everything returns again – we still use the expression 'the foundation stone'. According to Eliade, 'The

[51] '… *atlas excelsus on the same subject, many curious devises … chronograms*' (British Library, 1743).

fountain in this case, the rock, becomes the bond between the cosmos and myth. Between the real lower world and the terrestrial … And it has the mystical power of regeneration.'[52] And like the centre point of palindromes, this rock is the bond between real and mythical time. 'Finally because of its situation at the center of the cosmos, the temple or the sacred city is always the meeting point of the three cosmic regions: heaven, earth and hell.'[53]

[52] Eliade, *The Myth of the Eternal Return: Cosmos and History*, p. 8.
[53] Ibid., p. 15.

Palindromic Fountain

> A mortal's soul seems
> Like the water,
> From heaven coming
> To heaven rising
> Again renewed then
> To earth descending
> Ever changing.
> (from 'Song of the Spirits over the Water'
> by Johan Wolfang Goethe)[54]

Water since antiquity has been linked to the ideas of transformation, purification and cleansing, in both a literal and a metaphorical sense. It is not coincidental that the most celebrated ancient Greek palindrome, NIΨON ANOMHMATA MH MONAN OΨIN (wash your sins, not only your face), refers exactly to those allegorical qualities of water.

In the Greek example, meaning and poetic structure are combined in an exceptional way and palindromic qualities are immediately related to those of water. The example of the Latin palindrome and its relation to fire, death, consumption and memory has already been mentioned. A first reading of the Greek palindrome reveals a relation to the procedure of cleansing and purification with the mediation of water. But the palindromic arrangement of the letters also relates to the temporal, motional and metaphorical qualities of water. Like water, palindromes have the symbolic meaning of death and rebirth. In their mirrored function and reversible procedure, they have the ability of consuming their own image and meaning (like the surface of water consumed Narcissus or the periodic rebirth of Phoenix in successive circles). And as water cancels its form in nature's reversible procedure, the palindromes are characterised by their ability to cancel meaning in their own reversible motion. Water

[54] Marilyn Symmes, ed., *Fountains Splash and Spectacle: Water and Design from the Renaissance to the Present* (London: Thames and Hudson, 1988), p. 34.

has often been used as an illustration of time in space to represent flow of time or periodic repetition of time in recurrent events. In nature we meet the horizontal movement of water in relation to time (the waxing and waning of the sea according to the periodic movement of the moon) or its vertical movement as water changes form, from ice, to liquid, to vapour, in circles, returning to its origins. The stream of the river was also related to the flow of time: 'This River is the river of Time. It casts souls only upon its bank; it carries away everything else without effort.'[55]

The above example (Νίψον ανομήματα μη μόναν όψιν) was often inscribed on fountains cyclically around the structure or in arches and domes. In these cases the mechanism of the palindrome and the structure of the fountain or spring are combined in a remarkable way. Apart from the mental effort and imaginary movement between palindromes' distinct elements, these examples require physical movement in three-dimensional space in order for the palindrome to reveal its meaning.

These two pictures (fig. 21 and fig. 22) show typical examples of monastic Byzantine architecture from Greece. The one on the left (fig. 21), from 1854, is from the monastery Genesis of Theotokou (mother of God) in Kuparissia, Greece.[56] The fountain is a container for the 'holy water' used every year in the ritual of the Consecration of Waters. It follows the pattern of St Sophia in Constantinople where, according to testimonies, in the yard of the church was a spring running 'holy water', over which was built a circular fountain with the palindromic inscription ΝΙΨΟΝ ΑΝΟΜΗΜΑΤΑ ΜΗ ΜΟΝΑΝ ΟΨΙΝ. That example does not survive today but

[55] Heraclitus (fifth century BC), who was called the philosopher of fire and water, was the first to introduce this metaphor to western philosophy. One of his most famous quotes is, 'On those who step in the same river, different and different waters flow', meaning that we cannot enter the same river twice as time (the waters) will be different. Translation based on Kostas Axelos, *Héraclite et la philosophie* (not translated into English). Kostas Axelos, *Héraclite et la philosophie: La première saisie de l'être en devenir de la totalité* (Paris: Éditions de Minuit, 1962). Κώστας Αξελός, *Ο Ηράκλειτος και η Φιλοσοφία* (Αθήνα: ΕΞΑΝΤΑΣ, 1976), p. 58.

[56] Picture and information obtained from the site of municipality of Souli: http://gym-n-souliou.ser.sch.gr/axiotheata/prodromou.htm (accessed 6 August 2005).

similar buildings exist all over the regions of Byzantium. The second picture (fig. 22) comes from the medieval monastery St Prodromos, Souli, Greece.[57] According to myth, the monastery was established around a spring which was discovered by accident. The water was believed to be holy because on the same site an icon was buried depicting the Virgin Mary. On top of this spring we can observe the same palindromic inscription (ΝΙΨΟΝ ΑΝΟΜΗΜΑΤΑ ΜΗ ΜΟΝΑΝ ΟΨΙΝ) as in Kiparissia. Those cases follow the ancient Greek tradition, which continued in Byzantium and in the Orthodox religion.

Figure 21 Container for the 'holy water', Monastery, Genesis of Theotokou (mother of God), Kuparissia, Greece, 1854.

Figure 22 Spring with palindromic inscription. From St Prodromos, Souli, Greece.

[57] Picture and information obtained from the monastery's website: http://www.monastery.gr/monastery.htm (cited 6 August 2005).

The palindrome is a linear text, a ‘chain’, which can be expressed circularly as it connects elements in a circle first to last, second to second to last, and so on, and each element has its corresponding element in the chain. Domes, vaults and arches are the forms that relate most to the palindromic text because each block in one side needs its corresponding block at the other side. Each element of the construction is unique but mirrors itself to the other side, both in position and in shape. If the law is broken then the structure, both of language and of space, will collapse.

To conclude, the palindrome, under a tradition of spatial writing, could be viewed more as an object that operates in close relation to the building itself. Very simply, when an architect or technician wants to construct a dome, an arch or a staircase, he or she has to mark stones in a palindromic way: stone A left to match stone A right, stone B left to stone B right, and so on. These stones could easily form a palindromic sequence, either marked on stone or in the architects memory, and could very easily adapt to develop poetry’s form: a poem both for the mind and for the site and which at the end, engraved on stone, would become inseparable from the object itself. The experience of the dome, arch or staircase would carry something from the experience of the palindrome and vice versa, like the book with the eagle examined before.

The Palindrome as a Critical Tool for Architecture.

What this study of the palindrome demonstrates is that the concepts of architectural and textual space have a similar nature and that this is true regardless of the period and/or the theoretical context in which these terms are being expressed. This reading of the palindrome shows how spatial experience in text and architecture is based on narrative and generated by geometric relations between concepts/objects or signifiers/signifieds. Non-linear narratives such as those generated by palindromes create more possibilities of reading or, to put it another way, more ways of moving within the possibilities of experience they create.

For writing, narrative is the underlying structure upon which a story is built. It is not identical to the story itself – although story and narrative very often coincide – but rather narratives are about how this story is recounted. Thus, narrative can be examined as an autonomous system. In general a written narrative could be either linear or non-linear, expressed either as an hierarchical sequence of events in a temporal progression from one event to another or as a non-hierarchical one where the unfolding of events and their time are organised in a more complex and multifaceted way. Very often these more complex narrative organizations are geometric; in case of the palindrome, they are expressed as mirror symmetry.

In architecture the narrative frequently coincides either with the decoration of a building or with the story the building wants to tell. Typically, architectural narrative is equated with the stories recounted by architectural features, for instance, sculptures, friezes, or paintings applied to the building, or as the stories the building's form itself is meant to communicate as is the case with monuments or memorials. It is very rare that the narrative in architecture is seen as a more abstract and autonomous

structure that underlines the whole building, describes its parts and is even able to build it. For example – as I examine in more detail later – George Hersey studied the Greek temple as an algorithmic narrative that provides all the necessary information for the buildings' scale, distribution of spaces and spatial features and the relation between architectural elements all inscribed on a three-dimensional grid.

On a greater architectural scale, such as that of the city, it is even more rare to find narrative treated as something distinct and independent of the stories recounted by its elements. But there are some important exceptions. If we consider mnemonics, Latin semiotic theory or the rhetorical strategies of Cicero, we see that the city is perceived as *a repository of signifiers*, an argument in motion, that constructs an actively evolving narrative upon which stories are built and multiple possibilities of reading and experience are provided.

In this dissertation I see architectural narrative as being closer to what Vitruvius defines as *writing on architecture*, when for the first time in history he creates a language not only to talk about architecture but also to use it as an essential descriptive and design tool. To write on architecture Vitruvius borrows terminology from the disciplines that traditionally deal with writing, such as history and poetry, distinguishing two types of writing: one tells a story (history), and another one constructs the system upon which this story is told (poetry). Following Vitruvius's view, we can consider the building as a narrative rooted in both the geometric and descriptive qualities of writing, one that constructs the scaffold upon which the other is told. In this sense, drawing can be seen to be the equivalent of a text in literature, the medium that carries both the story and its structure. Writing can be seen to be the equivalent of designing, an active practice that produces texts and drawings. Vitruvius for the first time crosses the boundary (or possibly defines the boundary) between the

disciplines of architecture and literature and examines how texts are drawn in order to write on architecture.

Memory in such a context of architectural narrative plays a very significant role because it has a certain materiality and spatiality. Memory is seen not only as remembrance, a psychological and emotional process of reflecting on past events (like a historic narrative), but also as the space of imagination (like a poetic narrative). This is why it is important for this research to focus on theories that examine the materiality of memory and on practices like mnemonics and how these evolved and transformed over the centuries from Orpheus, Aristotle, Cicero, Bruno, Mallarmé, Perec and Baudrillard.

Experience of both textual and architectural space is largely dependant on reading, or the way the individual decides to move through narrative. Reading both a written or architectural narrative is an active process of moving between the story and its structure and the space of imagination and reality that surrounds us. The palindrome's reading as a kind of narrative that both constructs (poetry) and tells a story (history) generates a very precise movement (forward/backward) and experience (repetition/reversion/cancellation).

The palindrome on the one hand reminds the reader of text's spatiality and, on the other, of space's textuality. When reading a text – in particular a linear text – one gets so immersed within the story that one forgets that reading is also a physical operation that involves the human body in relation to material objects like the book or the words themselves; it is a movement within space. The palindrome, with its non-linear mirror function of motional/temporal reversibility and cancellation of meaning, constantly reminds the reader of the narratives' geometric or poetic character. The reader can burrow in linear texts and forget he/she is reading but this is not the case in

non-linear texts like the palindrome in which the reader remains in an indeterminate state between meaning and its materiality, remembering and forgetting.

A similar process takes place for architecture, except that it occurs in reverse. Architectural palindromes constantly remind occupants of space's textuality. Occupants or dwellers of architecture often get so immersed within the materiality of buildings, cities and other architectural structures that they forget architecture's ability to generate narratives. The occupant of architecture can easily burrow in 'linear architecture' and forget he/she is submerged in space but this is not the case in non-linear spaces like the palindromic ones where palindromic spatial experience produces an indeterminate state between materiality and meaning, memory and forgetting. As in literature, linear architecture could very briefly be described as one that follows a linear narrative, otherwise a hierarchical unfolding of relations between material objects and their meaning in comparison to a non-linear one, which follows more complicated geometric relations between material objects and meanings or concepts; in the case of the palindrome, an architecture that follows the non-hierarchical laws – as any hierarchy in the palindrome is been reversed and thus cancelled – of mirror symmetry, motional and temporal reversibility and cancellation of meaning.

Literature's spatiality or architecture's textuality generate spatial experience for any kind of reader or occupant, though it will not necessarily be the identical spatial experience. The palindrome's double horizontal and vertical symmetry displays exactly the above relation between body and the mind, image and memory, its perception (horizontal palindromic movement) and recollection (vertical palindromic movement). The reader or occupant stands in the middle, fragmented, scattered and then recollected within the book like in Vitruvius' case in *Ten Books on*

Architecture or within the building like in Camillo's case and his memory theatre. All these examples will be analysed in detail through this research.

For now I will use two architectural drawings from completely different periods that will be examined in relation to the palindrome. The purpose is to investigate some of the above ideas and demonstrate how reading a space through a drawing is related to a palindromic narrative and experience.

Palladio's villa Capra (La Rotonda), (1591) could be very easily considered palindromic because has a clearly defined mirror symmetry. The drawing's obvious mirror symmetry (fig. 23) is the horizontal palindromic symmetry described in the definition of the palindrome and it has a topographical nature similar to what has described before for a textual palindrome (fig. 2). It exhibits a symmetry of distribution around a centre point and a double axis of rooms, corridors, and stairs, like the distribution of the letters in the textual palindrome SATOR-ROTAS (fig. 23). This distribution of elements in both the palindromic drawing and text creates the geometry of a square that could easily be rotated 90 or 180 degrees or mirrored but still read the same fulfilling the law of reversibility.

Experience is related to reading or moving through the building's narrative. In other words, the experience of the architectural palindrome occurs when someone starts to read by actually moving within the building – exactly as in the SATOR-ROTAS palindrome – and the different possibilities of reading space it provides; this is the vertical palindromic symmetry described before for a textual palindrome (fig. 3). In this case the body's movement in combination with memory and imagination creates a feeling of strangeness and disorientation and the folding of the villa's space and time in the form of a deja-vu. This happens when someone walks through the

rooms or spaces of the building and does not know if each room or space is the same or similar to the one visited before or to the one that will be visited afterwards.

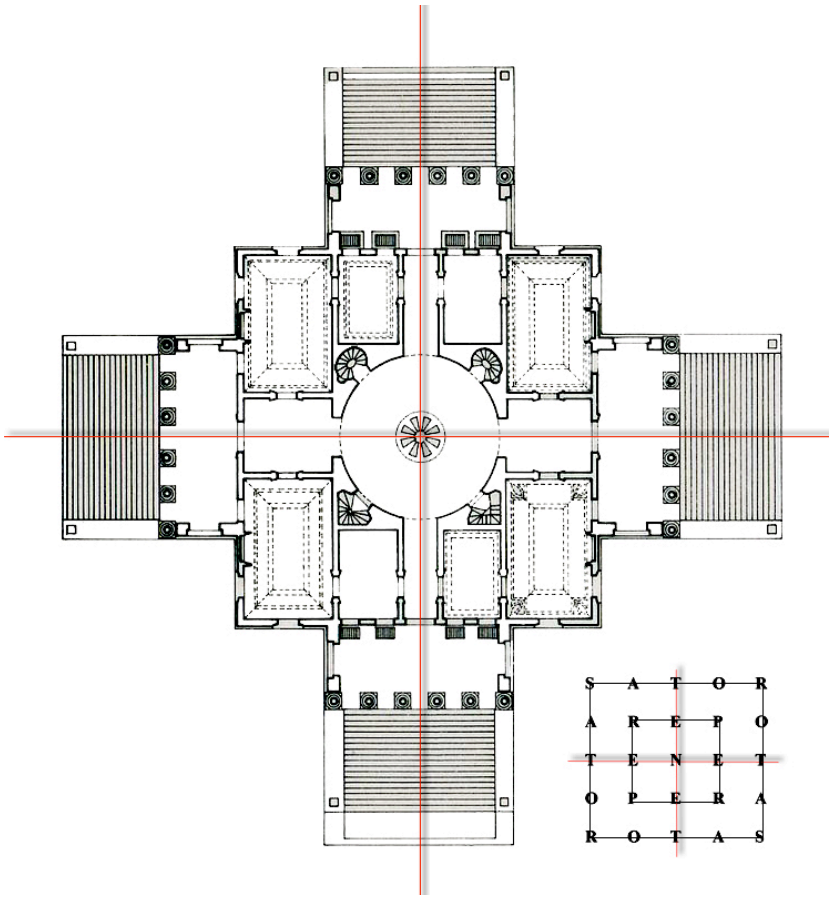


Figure 23 Palladio, villa Capra's (La Rotonda) drawing in comparison to the SATOR palindromic square. Both drawing and text follow the similar geometric arrangement and distribution of their elements. From http://www.GreatBuildings.com, additions by author.

This process fulfils the law of cancellation of meaning analysed in the definition of the palindrome. It seems that a building can be reversed like a palindrome or, to be more accurate, that the experience of architectural space can be reversed like the experience of a palindromic texts' space. Of course neither the building's nor the text's material characteristics change, they both remain stable and static (unless if we physically rotate them but even in that case they will remain the same) but what is reversed, rotated or folded is the reading of both architectural and textual space. And this reversion or folding of space is a reflection on the palindromic mirror of the

building, as every image and idea produced could be reversed and thus re-imagined and re-created constantly. But again it is not the actual architectural or textual space that is cancelled – the building or text remain intact – but the images which are perceived, processed and created within the readers memory; in other words what is cancelled is the way we move physically and mentally within this space or in other words the experience of architectural or textual space.

This function of symmetry, reversibility and cancellation described above for both text and architecture creates a very coherent space, a space that is very well kept together and upon which the mind can rest, like Vitruvius's idea of harmony. This possibly happens because this movement of both the body and imagination within the palindromic space although creates a reading with numerous possibilities of movement at the end they always remain the same; all images fold back to themselves and everything to where it started. Despite all this constant motion, nothing changes: the space produced is perceived as stable motionless, and restful. Narrative could be viewed as the mechanism that predetermines the way we move within architectural or textual space, how we experience them through reading them and a very simple geometric narrative like the palindrome clearly demonstrates that these spaces are not so different in nature and experience between them.

Moving to Le Corbusier's (1887 - 1965) villa Stein (1926) in Garches: from a first look it could not easily considered to be palindromic. The horizontal and vertical palindromic symmetries are not so clearly defined and although they still exist with a function similar to the one described before, they are merged together both in the plan and in memory. The mirror symmetry in villa Stein is structural and well hidden within the final building. Following Colin Rowe's analysis,[58] these palindromic

[58] Colin Rowe, *the Mfathematics of the Ideal Villa and Other Essays*, (London, the MIT Press, 1976).

symmetries are evident in both the arrangement of columns but also in the distribution of dimensions and division of spaces within the building (2,1,2,1,2 and 5,1.5,1.5,1.5,5) forming the building's geometric narrative, (fig. 24). Although these sequences in the final drawings and building become invisible and their experience is less obvious than villa Capra, they still play a significant role in keeping together the space created both structurally and mentally, in a way that is not so different from the previous example. Although villa Stein is based on a similar palindromic narrative to the one before, space here is not dealt with as rooms but as a unified whole and palindromic experience is not based on the movement from room to room and from space to space but in the way palindromic symmetry functions to keep the building's space tied up together in a coherent unity so that all elements of space like surfaces, stairs, external and internal rooms that are seemingly freely scattered around do not get dispersed and lost both structurally and mentally.

Although villa Stein's palindromic space is not experienced in a form of deja-vu as in Palladio's example, the result is similarly stable and coherent. Structural elements here are dealt like the letters of the palindrome, as points, and start to lose their material character, although still have the ability to define and construct space. The columns of villa Stein are almost hidden and seems they are trying to disappear completely within space, in many cases they get integrated with other elements like walls or stairs that supposedly should be free to be placed whenever desired.

The elements that consist of villa Stein's space also here can be mirrored, reversed, placed differently and be re-defined and re-located without changing the overall spatial values of the building. In this way, this Le Corbusier has the freedom to organise rooms and other spatial elements according to orientations, views and in relation to the outside, which anyway happens also in Palladio's villa Capra where the

symmetry of the four porticos is re-defined and there are deviations from it in order to complement the landscape around the building. Both villas have a strict system upon which they create their deviations, the difference is that Palladio's is based on walls and Le Corbusier's on columns (which might reflect each periods' technology).

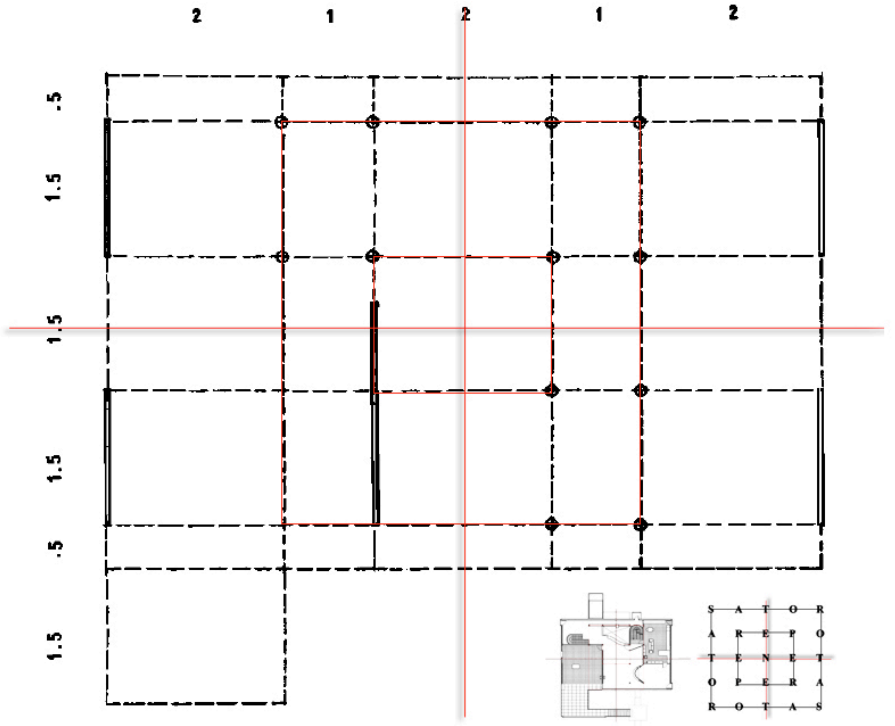


Figure 24 Le Corbusier, villa Stein's drawings in comparison to the SATOR palindromic square. Both drawing and text follow the similar geometric arrangement and distribution of their elements. From Colin Rowe, The Mathematics of the Ideal Villa and Other Essays, London, 1976, additions by author.

Palindromic experience in Le Corbusier's example is being externalised; it is outside the human body, the memory and imagination. In this case the building's geometric narrative is given great importance and the occupant dwells more within the buildings' spatiality rather than its textuality. Le Corbusier does not acknowledge any kind of historic narrative in his palindromic symmetry and, although this textuality exists, it is very well hidden within the structure and the building's palindromic story of mirror symmetry, reversibility and cancellation is well hidden behind walls and stairs. Experience is that of the freedom of pure geometry. Although

it might sound oxymoronic, this freedom is framed within a very solid, stable even restricting structure.

This palindromic spatial experience defined very briefly by the above examples in some textual and architectural spatial narratives this research is going to identify and follow. This palindromic spatial experience is a non-linear way someone could envision space and work not only with the palindromic form but within the palindromic space itself.

Spatial Palindromes

This dissertation studies the relations between text and space or between writing and architecture through palindromes. This part, Spatial Palindromes, focuses on the palindrome as a spatial structure inherent in text and aims to move from the general to the specific; from a tradition of spatial writing and its theory to some particular case studies.

Studying the palindrome first helps us to establish the existence of a tradition of spatial writing, of which the palindrome is an integral and highly recognisable part. Second, it reveals how methods of spatial writing have been applied in various examples from books and buildings. By tracing the palindrome back to its first recorded accounts and following its evolution, we will examine its role – and the role of spatial writing more generally – in three general schools of thought and in three specific examples. These theoretical schools are classical philosophy, mnemonics, and structuralism including post-structuralism. The three examples are: a book structured as a building (Vitruvius' *Ten Books on Architecture*); a building structured as a book (the ancient Greek and Roman temple); and a book which has also been a building or vice versa (Camillos' memory theatre).

Classical Philosophy

In western poetry the form of the palindrome can be traced back to ancient Greece. According to Augarde, the first 'palindromes are found in ancient Greek writings, such as the epigrams of Nicodemus of Heraclia, that may date back as far as the third century BC'.[59] The invention of palindromes is attributed to Sotades of Maroneia, Thrace, a Greek poet and satirist of the third century BC. As the inventor of these verses, which violated the use of language with their magical and mysterious qualities, he was condemned to a violent death. According to the myth, with one of his poems, Sotades 'made a mistake of lampooning Ptolemy II Philadelphus, who had him captured, sealed in a lead box, and cast into the ocean'.[60] It is difficult to locate exactly the context in which the palindrome was invented, but as the first statement we have comes from ancient Greece it is important to look briefly at some of the theories around the concept of spatial writing. These will help to follow palindromes' later evolution and use in various examples.

In ancient Greece the boundaries between the disciplines of space, poetry, language and geometry were not clearly defined so it is hard to distinguish and examine them individually. For example, 'poetry' or poetic speech was not clearly separated from philosophical or mathematical speech. A representative example is Plato's (427–347 BC) utilisation of both to create for the first time a definition for 'space'.[61] In *Timaeus* (c. 360 BC), Plato devised and used the word 'space' (Χώρος, Choros) to describe a more abstract concept than geometric space. Plato's illustration

[59] Tony Augarde, *The Oxford Guide to Word Games*, 2nd ed. (Oxford and New York: Oxford University Press, 2003), p. 109.
[60] Howard W. Bergerson, *Palindromes and Anagrams* (New York: Dover Publications Inc., 1973), p. 1.
[61] 'For some time Plato does not use the word "Space"; it first occurs in the conclusion, led up to by a series of images that are designed to elucidate gradually a nature more "obscure and difficult" than geometrical space.' Francis M. Cornford, *Plato's Cosmology: the Timaeus of Plato* (Indianapolis and Cambridge: Hacket Publishing Company, 1997), p. 156.

of the concept of 'space' is based on the description of the ideal solids or elements – tetrahedron (fire), octahedron (air), icosahedron (water), cube (earth) – their relations and how combinations of these create reality or instances and reflections of it. Instead of using drawings or sketches, Plato uses language and text to describe these ideal solids as well as their values and characteristics. The outcome is that Plato's account of space is partly a geometrical theorem and partly a poetic image, without being either completely. Plato uses text and geometry to mobilise imagination and create an account, an image or a speculation of the 'idea' of space; he creates a reflection that constantly shifts and changes according to the individual, time and cultural context; something more fixed than an abstract poetic image and more flexible than a geometrical theorem, that mobilises both memory and imagination.

If Plato's writing captures a reflection of a visual image of 'space' in memory as something that exists outside the body, Aristotle's (484–322 BC) gives spatial qualities to memory itself. Aristotle recognises for the first time the pictorial importance of letters in memory. He relates memory to the act of writing on a wax tablet and gives a spatial quality to memory by defining mental places (τόποι, topoi) as divisions of mental space where the topics of the subjects of an argument are placed. An example is to create a mental grid and place in its divisions or 'spaces' visual representations of the topics of the argument to be remembered. According to specialist in memory and mnemonic technique Mary Carruthers, in her analysis of the 'locational memory' in Aristotle's writings:

> Aristotle taught also that *every memory is composed of two aspects*; a 'likeness' or 'image', which is visual in nature (*simulacrum*), and an emotional resonance or coloring (*intention*), which serves to hook a particular memory into one (or perhaps more) of a person's existing networks of experience. *Memory works by association*. Its connections are thus individual and particular, not universal – though they can of course be learned. The logic of memory is essentially 'arbitrary', in the Latin sense – dependent on one's experiences (including everything one has learned), desires, and above all will:

> recollection, like all creative thinking, is thus largely driven by will and desire.[62]

This identification of memory's function to operate between and possibly relate the space 'outside' and the space 'within', from both Plato and Aristotle, is very important because palindromes as textual geometric structures belong somewhere in between, or possibly link these 'spaces'. When reading a palindrome one has to mobilise a double and symmetrical movement (horizontal and vertical) as discussed before; one movement takes place on the page (see or read and use memory to visualise the mechanism of the palindrome), and one through the page (store and recollect, on a double motion, the image).

Both Plato and Aristotle reflect the main philosophical enquiries of their period and before. In ancient Greece two philosophical traditions existed, the Orphic and the Pythagorean, which related 'poetry' – long before the term 'philosophy' was invented – to a theory of the world's creation, and interestingly, the palindrome is related to both of them: it is a poem and at the same time a geometric arrangement. The distinction between the Orphic and the Pythagorean reflects other pairs of philosophical oppositions, such as the Dionysian and the Apollonian or materialism and idealism. The boundaries between the Orphic and the Pythagorean once more are not clear; just as Apollo and Dionysus were brothers, Pythagoras was Orpheus' heir. Such a separation serves mainly to highlight the philosophical tensions of the period that shaped discourse about 'poetry' and space that continues today. For now it is worth noting that the above distinction between Orphic and Pythagorean has its basis in text and the way language and writing, with the contribution of imagination, create

[62] Mary Carruthers and Jan M. Ziolkowski, eds, *The Medieval Craft of Memory: An Anthology of Texts and Pictures* (Philadelphia: University of Pennsylvania, 2002), p. 8.

images, and what kind of images, specific or abstract, material or immaterial, based on reality or mathematics, or somewhere between.

According to philosopher Charles Khan, in his history of Pythagoras and the Pythagoreans:

> It is clear here that we have two parallel traditions, easily confused with one another but originally quite different in form. The early Pythagoreans relied upon oral teaching and committed nothing to writing; the Orphic cult is almost by definition based upon written texts, the poems of Orpheus. Orphic practice is associated with the ecstatic Bacchic cult of Dionysus; the Pythagorean tradition prefers the Pythian or Hyperborean Apollo and preaches an austere life. The cosmogony of the Orphic poems is filled with strange myths and weird divinities; there is no place in such 'theologies' for Pythagorean mathematics or Ionian natural philosophy.[63]

Both of these traditions or philosophical and theological systems had their own account of how the world was created and how it could be explained: one of them based on poetic writings and the other on oral mathematics and geometry,[64] the poetic image against an abstract mathematical one, the opposition of text against remembering. But these are two different ways of understanding how memory relates to language or text and the construction of space: one able to create abstract models of the world based on Pythagorean, Cartesian or Einsteinium space; and another capable of creating a poetic image of space as in *Un Coup de Dés* or the poetic space as defined by Baudrillard. The palindrome seems to belong somewhere in between as it is partly theorem, partly poetic image, and is expressed in language, text and architecture. By looking in more detail at the Orphic and the Pythagorean traditions, we will examine the cultural frame under which the palindrome was invented or appeared in history for the first time.

---

[63] Charles H. Kahn, *Pythagoras and the Pythagoreans: A Brief History* (Indianapolis and Cambridge: Hackett Publishing Company, Inc., 2001), p. 21.

[64] Orphic cosmogony is based on the image of the 'cosmic egg', and Pythagoreans tried to use an abstract system like mathematics or geometry to explain the universe.

Orpheus

Orpheus, the poet, was king of Thrace, son of Oeagrus, or according to another version, son of Apollo and the Muse, Calliope. Orpheus was one of the Argonauts, a member of Jason's crew in the expedition to retrieve the Golden Fleece; his music and poetry protected the ship from the Sirens. If this detail is roughly accurate, Orpheus lived before the Trojan war (between the thirteenth and twelfth centuries BC), His poetry was believed to have power over both the material and the immaterial worlds. The stones, the trees and the birds were enchanted by his singing, and his poetry protected him in his journey to the underworld to retrieve from Hades his wife Eurydice, who had died from a poisonous snake bite. According to the myth, against Hades' command Orpheus looked back at Eurydice on his way back to the surface, and saw his wife disappearing forever into thin air. Because of his sorrow and dedication to Eurydice, Orpheus refused all female love, which infuriated the Maenads – Thracian priestesses of Dionysus – who cut him into pieces and threw the parts in the river Evros. Orpheus's head, still singing, ended up on the island of Lesvos, wheret a shrine was built dedicated to his name.[65]

In Orpheus' descent to the underworld – the realm of the immaterial – poetry protected him against the guardian beasts of Hades, but most of all against oblivion. The major danger the 'shadows' of the underworld had to face was forgetfulness, the inability to remember who they were, their loved ones and details of their previous life. Orpheus' poetry not only assisted him to remember his identity and mission but also helped Eurydice to recognise him. From the thirteenth and twelfth centuries BC

[65] There are numerous versions of the same myth. For more on the myth of Orpheus see Charles Segal, *Orpheus: The Myth of the Poet* (Baltimore and London: The John Hopkins University Press, 1989) and W.K. Guthrie, *Orpheus and Greek Religion: A Study of the Orphic Movement* (Methuen, 1935).

on, different kinds of memory – locational, mnemonic, topographical or abstract – become a recurrent element within philosophy, viewed either as the song of Orpheus, or as the Aristotelian 'topoi', the architectural mnemonics and the experience of the void in Mallarmé's poetry (Mallarmé was trying to resurrect his dead son with poetry, in a similar way to Orpheus resurrecting his wife).

Apart from references to places like Thrace, Evros and Lesvos, it has not been determined which parts of the Orpheus myth are real or even if the poet was a historic person. However, it is widely accepted that his poetry represents the first and oldest Greek cosmology and one of the earliest attempts in western thought to describe the beginning of the universe. What is significant for this dissertation is that Orpheus' story is one of the first theories of how text could influence both the material and the immaterial and could relate to the comprehension and construction of reality. This idea we are going to find later in various examples, such as Georges Perec's *Life A User's Manual*, which explores ways to create an imaginary textual building, and Stéphane Mallarmé's *Un Coup de Dés*, which investigates the limits of the materiality of language, trying to create a poem-space.

Apart from Dionysus,[66] the dismembered body of Orpheus recalls the dismembered body of God within anagrammatic poetry, mentioned briefly in the introduction and analysed further in the next section. Orpheus, the poet and the god, is scattered around the world, and the pieces, flowing in water, survive in the fragments of his poetry. Baudrillard, using the anagram as example, similarly defined the space unfolded by the breaking up of linearity between signifier/signified, or by the 'dismemberment' of language between materiality and meaning, a space of endless

[66] According to the myth, Dionysus was dismembered and eaten by the Titans. This gesture upset Zeus, who killed them with his lightning. From the merged ashes of the Titans and Dionysus, who was consumed by them, were brought to life humans, having a divine element in them – half good from Dionysus, half evil from the Titans.

potentiality and difference. In addition to Baudrillard and the space of Orpheus' dismembered body, Greber pointed out anagrams' and palindromes' cannibalistic nature in language, claiming that 'letter permutation is an operation in the surgical sense'.[67] Apart from anything else, the myth and teachings of Orpheus have influenced poetry massively over the centuries, especially the examples of Valéry and Mallarmé, which are important for this research.

According to Plato's criticism of the myth in the *Symposium*,[68] Orpheus did not dare to die for love, and making the journey to the underworld alive was an act of hubris towards the gods and his wife. The Thracian poet was not presented with Eurydice but an apparition of hers, and was condemned to suffer a tragic death. Both the poet and his wife were caught in a cycle of remembrance and oblivion, neither to remember nor to forget. Orpheus could not remember his wife because he was not able to forget and Eurydice was condemned to remember and never forget, both of them suffering endlessly. Possibly this cycle of remembrance and oblivion is inherited in textual forms like the palindrome. A difference is that this space of 'unfulfilled' love, God, void or the poetic, this space of 'hubris', as suggested by Plato, is also full of possibilities, unsettled and creative, containing the generative forces and possibilities of reality.

The contents of Orphic poetry is very ambiguous, mystical and highly obscure; the oldest direct reference comes from the fifth century BC and the Derveni Papyri,[69] but there are many commentaries and references to it in ancient philosophers

[67] Greber, *Palindrome Semiotics*.
[68] Plato *Symposium* ed., trans. by C.J. Rose (Warminster, England: Aris & Philips Ltd, 1978), p.31.
[69] The Derveni Papyri (towards the end of fifth century BC) is a manuscript that comes directly from ancient Greece. The Papyri were discovered very recently (1962). According to Gábor Betegh, 'Pythagoras could be considered a forerunner of the Derveni papyrus … who in a bold allegorical interpretation read into Orpheus' theogony the natural philosophy of Anaxagoras (c. 500–428 BC) and Diogenes of Apollonia (fl. 440/430 BCE).' Gábor Betegh, *The Derveni Papyrus: Cosmology, Theology and Interpretation* (Cambridge: Cambridge University Press, 2004), p.75.

from Pythagoras to Plato and Aristotle, and later Ovid. In general, Orphic poetry is based on beautiful images and descriptions of the origins of the world; one recurring theme is that the world is being created by the inhalation of nothingness from the Cosmic Egg, which was laid in nothingness by the Night.

Pythagoras

Palindromes, being geometric narratives, are also related to the tradition of the Pythagoreans. Pythagoras lived around 580 to 500 BC and was believed to be the son of Apollo. He is considered to be the founding father of mathematics, music, astronomy and philosophy; it was he was the one who invented the word 'philosophy' to describe his teaching. Pythagoras was born in Samos in a period of unique developments in art, architecture, technology, literature and philosophy. For example, when Pythagoras was young, one of the most remarkable achievements in the history of engineering was constructed in Samos: a tunnel under a mountain to provide the city with water.[70] The excavations of the tunnel started simultaneously from the two edges of the mountain and the workers met in the middle. The project was designed and realised by the architect Eupalinos of Samos, whose name has been mentioned before in the definition of the palindrome in Paul Valéry's *Eupalinos or the Architect*. Eupalinos' project took years to accomplish, was very carefully calculated, designed on a drawing board, and was a very likely influence for Pythagoras' development of a theory where mathematics is a language able to construct the world. The island of Samos was also geographically very close to Miletus and Ephesus, two of the most important cities of antiquity. Miletus was the home of Thales (c. 624–c. 546 BC) and of Anaximander (c. 610–c. 546 BC), who was also a teacher of Pythagoras, and was where the gridlike urban organisational layout invented by Hippodamos (fifth century BC) was used for the first time. Ephesus was the city of Heraclitus (sixth century BC),

[70] 'It is hardly conceivable that he [Pythagoras] was not familiar with this bold engineering project, which was obviously designed on a drawing board, and which must have taken years to complete.' Christoph Riedweg, *Pythagoras: His Life, Teaching, and Influence* (Ithaca, NY: Cornell University Press, 2005), p. 46.

whose opposition to Pythagoras' ideas is known, and was home to one of the seven wonders of the ancient world, the temple of Artemis (completed around 550 BC).

Pythagoras moved from Samos to Croton in South Italy where, with his followers, he founded his school, which took the form of a religion. Pythagoras was influenced by Orpheus' teachings, and between those two cosmologies there are many similarities.[71] For example, Orpheus taught that the universe was created from the inhalation of nothingness or the void by the 'cosmic egg' and Pythagoras believed the void or the 'limitless' to be what distinguishes the 'nature of things, as if it were like what separates and distinguishes the terms of a series'.[72] The 'limitless' is being limited (inhaled) by the limit, the 'one', and by the 'one' comes the 'unlimited' dyad and the rest of the numbers. A similar idea is also found later in Mallarmé, who was fascinated by the fact that by adding zeros (nothing, or void within a sequence) you raise the values of numbers and where the void becomes a structural, integral element of poetry and the creation of 'space'.

As regards Pythagoras' contribution to knowledge, he combined mathematics, geometry and language into a more abstract philosophical system; it was a very early attempt to describe the world by using an abstract concept (mathematics) and not the natural elements (air, water, earth, fire). Pythagorean abstraction was based on the fact that numbers were provided with a level of abstraction not representing the real

[71] 'Walter Burket has pointed out similarities between this Pythagorean arithmo-cosmogony and ancient accounts of the origin of the world. In the latter, a shapeless unlimited stands at the beginning, and is called the "constantly flowing, unlimited depth of the sea". In it all things were mixed together. In the course of a spontaneously forming vortex, it takes on the form of an egg. The world-egg sucks the surrounding air (cf. the void) into itself, becomes pregnant and gives birth to a double-sexed creature called "male-female" (cf. the "even-odd" one) … because of its shining fiery appearance Orpheus gives it a name *Phanes* "shining, appearing" (cf. the central fire). This is the "origin of all". The "orderly arrangement of the world" (diakosmesis) follows and in connection with it the *harmonia*, familiar to us from the Pythagorean cosmogony is used.' Ibid., p. 89.
[72] Ibid., p. 88.

objects they used to stand for – as for example when counting pebbles –[73] but acquiring an independent existence of their own, beyond the real or the obvious that we see. But numbers for the Pythagoreans were not abstract quantities in the modern sense, and they still maintained physical, emotional or moral qualities; they were treated like entities, or ideal objects, able to construct the world. Numbers may not have been the pebbles themselves any more but they maintained some of their qualities: part of their materiality and the ability to combine in the creation of new objects. This is, for example, Aristotle's criticism when he accused Pythagoreans that their 'determination would befit the substance of the thing determined',[74] or to put it another way, that Pythagoreans were trapped into a linear one-way relation between a signifier and its signified. But even Aristotle acknowledges that they were the first ones to speak about 'formal causes', or about the relations between the object and its values and meaning, which requires a certain level of abstraction and detachment from the object itself, and its relocation to a different space – for Pythagoreans the space of mathematics and geometry.

With cases like the Pythagorean theorem,[75] a similar abstraction occurs to language as it is not any more representational or used to denote the 'things' themselves, but 'things' become ideas or expressions of ideas as we can observe, for example, in Plato's theory of Ideas: the word 'tree' is not 'the tree' anymore but an image or an idea of 'the tree', of which we can only see instances or reflections. The famous Pythagorean theorem is a representative example that demonstrates how language could generate an abstract spatial perception of reality based on mathematics

[73] '… the Pythagoreans were accustomed to visualize numbers by means of counting pebbles (*psephoi*).' Ibid., p. 86.
[74] Ibid., pp. 86–87.
[75] In any right triangle, the area of the square whose side is the hypotenuse (the side opposite the right angle) is equal to the sum of the areas of the squares whose sides are the two legs (the two sides that meet at a right angle).

and geometry, a perception that has also the ability to inform reality, measure, classify and even create the world.

An advantage of the abstraction of numbers and language to create a system of thought was that ancient Greek shared the same symbols, the twenty-four letters of the alphabet, for both mathematics and language, and thus every letter and word was charged with a mathematical value; in other words, reading was at the same time a form of counting and calculating.[76] In that sense, just as geometry is the expression of mathematics in space, language by obtaining a numerical value has the ability to be expressed geometrically and consequently spatially (apart from terms of meaning). The palindrome is an example of such an abstraction in poetic speech, where the form of language hides spatial characteristics; these are palindromic mathematical sequences that can be expressed spatially as mirrored symmetry. For example, if we add a number to its palindrome, we again get a palindrome. In that way a number is being exhausted by its own image, its own mirrored symmetry or reflection, like a Platonic Idea.

87 + 78 = 165

165 + 561 = 726

726 + 627 = 1353

1353 + 3531 = **4884**, a palindrome[77]

An interesting point of Pythagorean philosophy is the belief that 'the beginning of the fitting of the world is based on pairs of binary oppositions'.[78] According to Pythagoreans there are ten pairs in total: limit/unlimited, odd/even,

[76] 'The intimate connection between letter and number made by the Greeks meant that the letters of the alphabet automatically inherited Pythagorean numerical symbolism.' Kieren Barry, *The Greek Qabalah: Alphabetic Mysticism and Numerology in the Ancient World*, ed. Samuel Weiser (York Beach, ME: Samuel Weiser, 1999), p. 30.
[77] *Search for the biggest numeric palindrome*, http://www.floot.demon.co.uk/palindromes.html, (accessed 24 March 2003).
[78] Riedweg, *Pythagoras: His Life, Teaching, and Influence*, p. 85.

one/plurality, right/left, male/female, resting/moving, straight/crooked, light/darkness, good/bad, square/oblong, and all of them are manifested by the *tetraktys*, their sacred symbol. The palindrome's values *mirrored symmetry*, *reversibility* and *cancellation* are a manifestation of such pairs in poetry, but also of the palindrome's ability to operate as one single object comprising pairs of oppositions.

Heraclitus' philosophy is based on similar oppositional pairs. 'At least this is suggested by the importance of the "invisible harmony" (harmonie, also "fitting together") of opposites which … is contrasted with the measurable and "visible harmony", privileged by the Pythagoreans.'[79] In Heraclitus' case there is an invisible harmony of forces like hot/cold, humid/dry, fire/water, that strive to create the balance of the universe, instead of the measurable mathematical pairs of Pythagoras. But, as has already been noted, palindromes are a manifestation in text of the 'harmony' of opposites, both visible and invisible.

In addition, Nietzsche's idea of *Eternal Return of the Same* could reference Pythagorean philosophy and its contemporaries. Nietzsche himself acknowledged that the idea of Eternal Return comes from Pythagoras' polemic, Heraclitus, and the Stoic philosophers, a school of thought founded in Athens in the early third century BC by Zenon of Citium.[80] According to the idea of Eternal Return, the dwarf, and also Zarathustra, standing at the threshold of time, observe time as 'a circuit of unrolling moments, "nows", and "presents"',[81] eternally revolving; and in the infinity of this time there are infinite possibilities for the same combinations of energy and matter to occur again and again, endlessly. Pythagoreans believed in the 'periodic return of the

[79] Ibid., p. 52.
[80] Rogério Miranda de Almeida, *Nietzsche and Paradox*, trans. Mark S. Roberts (New York: State University of New York, 2006), p. 93.
[81] Ibid., p. 96.

same state of the world, the identity being based on number',[82] and consequently in a form of reincarnation.

The Pythagorean philosophical system, with the aid of mathematics, creates possibly for the first time an abstract mental space related to language that can be experienced by memory[83] (as in mathematics and geometry), something we will witness later. Just as in Orpheus' tale, memory – facilitated by poetry and music – was essential for the safe journey to the underworld, for the Pythagoreans memory had also an eschatological importance. Memory was important to remember the teachings of Pythagoras and for the soul to recall his advice for the transition to the underworld, as well as to select a good life when reincarnated.[84] The difference between Orpheus and Pythagoras lies in how memory is generated. In both cases it is by images, words and music, but what differs is their nature: poetic or philosophical, mythical or mathematical, visually figurative and concrete instead of more intangible and scientific.

Pythagoreans related mathematics to music, which was conceived as psycho-physical therapy, and created a more systematic theory of music based on mathematics that provided a model capable of explaining the interaction and the forces between the 'celestial bodies', the *Harmony of the Spheres*; according to this, music harmonics between the planets were keeping the universe in place and distances of planetary orbits were represented as musical intervals covering an octave. Not only did geometric forms and objects gain musical importance (*Harmony of the Spheres*) but also music became a study based on geometry (harmonical Pythagoreanism). This is possibly the origin of the palindrome's connection to music

[82] Riedweg, *Pythagoras: His Life, Teaching, and Influence*, p. 63.
[83] '… like Buddha, Socrates, and Jesus, the sage of Samos is supposed deliberately not to have written anything, so that basically there ought to be no original fragments of his work either.' Ibid., p. 42.
[84] Ibid., p. 30.

as well, as it helps to understand its employment as a structural, compositional form by many composers such as Guillaume de Machaut (c. 1300–77), Johann Sebastian Bach (1685–1750) in his Crab Cannon, Bella Bartok (1881–1945), Alban Berg (1885–1935) in his opera *Lulu* and Arnold Schönberg (1874–1951).

The philosophical system of thought of the Pythagoreans relates also to the Cabala. There is research that either treats Pythagoras' philosophy as the main influence to the development of Cabala[85] or suggests that Pythagoras was a Cabalist in the sense that he took inspiration from it.[86] The practice of Cabala could be viewed as a method of linguistic analysis of antiquity that stands between mathematics and language, geometry and space, image and memory, and this relates to a certain degree to the Pythagorean practice, although it is difficult to trace which influenced which. This connection of the palindrome to the mysticism of the Pythagoreans and to the Cabala is possibly one of the reasons why palindromes were closely related to magic and considered to be very powerful incantations. An answer to how palindromes can influence the physical world is suggested in formalist critic Yuri Lotman's (1922–93) claim, as it concerns letters' power over the physical world:

> We are referring not only to the auto-organisation of man's intellect with the aid of some sign system, but also to those instances where signs invade the sphere of primary signals. A man 'charms away a toothache with words'. Acting upon himself with the help of words, he bears suffering of physical torment.[87]

Although it is almost certain that Pythagoras was a historic person, there is some controversy as to what was his own teaching, what refers to other philosophical

[85] For more information see Kieren Barry, *The Greek Qabalah: Alphabetic Mysticism and Numerology in the Ancient World* (York Beach, ME: Samuel Weiser, 1999).
[86] I refer to Reuchlins's *Three Books on the Art of Kabbala* (1517), referenced in Riedweg, *Pythagoras: His Life, Teaching, and Influence*, p. 130.
[87] Yuri M. Lotman, *The Structure of the Artistic Text* (Michigan: Michigan Slavic Contributions, 1977), p. 8.

systems developed by other cultures like the Babylonians and the Egyptians,[88] and what has been attributed to him later by his followers and scholars. In contrast to Orpheus' practice, which was based on writing, Pythagoras' was an oral tradition. Also his 'school' in South Italy was organised on a highly mystical model; thus his own voice has been lost, and what is left is his scholars' interpretations of his teaching as well as his opponents' criticisms. On the one hand, there is Orpheus' written poetic images, and on the other, Pythagoras' oral, more abstract, almost 'scientific' theory of the world: two seemingly diverse, but in their content also similar, approaches to examine how writing or language could inform reality and create spatial experience, through poetic or mathematical/geometrical images. Pythagoras, like Orpheus, had power over material and could influence reality. Pythagoras, using mathematics and with remarkable accuracy, could measure long distances or surfaces of land, calculate the orbit of stars, or estimate the changing of seasons and natural phenomena; among his other achievements, he determined that the earth is moving around the sun[89] and created a theory to explain how the universe operates – the 'harmony of the spheres'. Consequently, with his system Pythagoras could predict and use design and mathematical, geometrical calculations to change reality; and language and its operations in relation to music, mathematics and memory was an integral part of this practice. It is no wonder that his teaching took the form of magic or religion. But from the Pythagoreans derives also one of the earliest testimonies for the tradition of spatial writing, and as will be examined later, they used to compose their doctrines in cubical form. By using such a form it was easier for the reader to store and recollect knowledge by memory, while more peaceful for the mind to 'rest' within this space of

[88] Pythagoras travelled extensively in almost all the big cultural centres of his period and definitely to Egypt, so it is believed that he was taught the secrets of Egyptian mysticism and religion, which he later passed on through his teachings.
[89] Riedweg, *Pythagoras: His Life, Teaching, and Influence*, pp. 130–31.

knowledge. Within such a context is also located the birth of the palindrome as another sort of spatial writing.

Sotades, the famous poet attributedwith the invention of the palindrome, , according to Augarde, was probably aware of both Orphic and Pythagorean teachings and traditions. Unfortunately there is no trace of Sotades' poetry or his palindromic ('Sotadic') verses, and what remains is only the myth around his name and his recognition as an important poet of Greek antiquity. Sotades may well have consciously tried to combine and relate within his poetry ideas of both Orpheus and Pythagoras, of mythical and geometric narratives, and combine them in a form such as the palindrome.

Vitruvius

But how could the ideas, theories and traditions that possibly gave form to devices like the palindrome relate to the construction of a text and to an architectural example? In antiquity the arts were not clearly separated, and both poetry and architecture followed the same philosophical, theoretical and technological advancements. To investigate some associations between a building and a book in antiquity, I am going to look at the ancient Greek and Roman temple and Vitruvius' *Ten Books on Architecture*: the temple because it crystallises antiquity's theoretical enquiries in architecture, and Vitruvius because here, possibly for the first time, someone transferred these ideas into writing.

The ancient Greek and Roman temple bridges centuries of evolution with many examples, typologies and styles throughout the Greek and later Roman regions. I am not going to focus on a specific example but rather on the temple as a type of building which I will use as a reference point to relate how the text and book are structured. The example of the ancient Greek temple will display how the imagery of the mind created by Orphic poetry, Pythagorean mathematics or Platonic Ideals could translate into a building and how a form of writing could relate to the form of a building. The temple was itself a poem and an 'axiom' similar to the Pythagorean, and its design was governed by laws that carried both in form and in content the world of Ideas as well as the world of the senses. It is not only the elaboration of the temple with strong visual narratives as ornaments and sculptures that recount a myth or story in metopes, frieze and pediments, but also the temple's elaboration with abstract philosophical and mathematical narratives that become integrated in the same structure or design of the building. In relation to the ornaments that carry the poetry

and singing of Orpheus, the very structure of the building carries the abstraction of the mathematical universe of Pythagoras, and the symbolism of the human body and the universe itself – or at least of what the universe was believed to be.

Vitruvius' *Ten Books on Architecture* is possibly the nearest available writing to the temple – apart from the temple itself – and also the book that shaped ancient Greek architectural influence from Rome to the Renaissance and until now. As in all other examples in this research, the main focus is not the book's content, but how it relates to the book's structure. In theory, as with the temple, there is a very large chronological gap, more than a thousand years, separating Orpheus' poetry, Pythagorean philosophy, Plato and Vitruvius. But Platonic, Pythagorean and later Stoic influences are central to Vitruvius' work.

Vitruvius believed, from his studies of the ancient Greek temple, that the ideal proportion derives from the human body, which makes the temple a translation or interpretation of the body in space. He attempted to transfer these ideas into the structure of his *Ten Books on Architecture*, organising or 'building' his book as a translation of the 'human body of architecture'.[90] As this research will demonstrate, Vitruvius' intention was to write a book in the way he would design a building, and to achieve such a task he employed the theory of his period and of the ancient Greeks. In this way the book, like the building, carries the scattered-in-the-world pieces of Orpheus' body – which according to the myth took the form of a shrine – but also it becomes a more abstract translation of the oppositional forces of Pythagorean philosophy or of the Platonic ideas for the universe.

[90] Indra Kagis McEwen, *Vitruvius: Writing the Body of Architecture* (Cambridge, MA: MIT Press, 2003).

This analysis, in relation to the palindrome, will help us to understand its theoretical context, how it operates and its architectural applications in antiquity, especially when, later in this research, domes are examined.

Vitruvius' Ten Books on Architecture as a Temple

Vitruvius himself stressed the difficulty of the task of writing *on architecture*. As there was no previous example, he drew references from other kinds of writing, such as history and poetry. Architecture's character – of being in between disciplines, neither history nor poetry, neither craft nor art – creates the difficulty but also the uniqueness and originality of Vitruvius' attempt. At the beginning of his fifth chapter on 'public buildings', Vitruvius writes:

> **Architectural writing is not like the writing of history or of poetry**. Histories by their very nature maintain the interest of their readers; they present the ever-changing anticipation of learning something new. With poems, on the other hand, it is the meters, the feet, and the elegant placement of the words, as well as the varieties of expression adopted by various readers as they take their turns in reading aloud, that carry our interest along to the end of the composition without a misstep.
> [Book V, preface, 1-2]. This is not possible for architectural writing because the terms that have been devised to meet the needs of this art inflict the obscurity of their unfamiliar language on our senses. To begin with, then, these words are neither obvious in themselves nor are their names clear from common use. Furthermore, unless the wide-ranging writings of authorities on this subject have been condensed and expressed in a few, **crystal-clear** sentences, the density of the prose, not to mention the sheer length of it, confuses readers' minds.
> Therefore, as I employ these esoteric names and the proportions derived from the components of architectural projects, I shall explain them briefly so they may be memorised. In this way, readers' minds shall be able to absorb the information more quickly.[91] [emphasis added]

For this part I am using Ingrid Rowlands's translation of Vitruvius' books as the most up-to-date one in English. In other translations, like Thomas Gordon Smith's, the phrase 'Architectural writing…' reads: 'Writing on architecture is not like writing on history or poetry.' The proposition 'on' seems closer to Vitruvius' intentions and is a different concept from the term 'architectural writing', which is a more contemporary one and possibly a more limiting reading, as it refers to his

[91] Vitruvius, *Ten Books on Architecture*, trans. Ingrid D. Rowland (Cambridge: Cambridge University Press, 1999), p. 63

writings as being about architecture, instead of a conscious attempt to create a unified body of architecture. It is representative, though, of an approach that sees writing as a more autonomous discipline, and writing about architecture as different from architecture itself. Such a small distinction could possibly help to understand Vitruvius' intention in the way he tried to structure his text as he would do a building.

In the above passage, Vitruvius seems to have some reservations about his effort to write 'on architecture', and knows that his book will possibly be criticised for not 'fulfilling' either 'the needs of architecture' or the needs of writing. Language as a tool 'won't express the solid aspect' of architecture as architecture could not operate as language, at least not in the way that it expresses itself in history or poetry. According to the above extract, history's texts are more engaging for the reader because there is 'an ever changing anticipation of learning something new', a linearity and a progression from subject to subject and from period to period. Poetry's texts in their turn have the advantage of a more solid structure ('meter, feet, placement of words') and a performative character ('varieties of expression adopted by various readers') that 'carry' the interest. To write on architecture and to transfer buildings to paper Vitruvius has to invent terms and create a language and methodology that contradicts the very nature of architecture: its solid character upon our senses ('inflict the obscurity of their unfamiliar language on our senses'). For Vitruvius, trained as an architect, language is an unfamiliar way to talk about buildings. He is aware that he has to move between history's anticipation for the new and poetry's structural and perfomative nature, otherwise his task will fail, and not only will architecture not transfer its knowledge and meaning but it will also confuse readers; it won't be interesting or stay in their memory. 'Therefore', Vitruvius continues, 'as I employ

these esoteric names and the proportions derived from the components of architectural projects, I shall explain them briefly so that they may be memorised.'

A new language has to be invented that belongs neither to history nor to poetry; it stands in the middle, relates to the tradition of spatial writing as defined in the introduction and is the language of architecture. For Vitruvius, architecture's equivalence to language is something based on proportions and analogy (it derives from Greek words ανά, *ana*, meaning repetition, and λόγος, *logos*, meaning speech or discourse), which could create – as in written or oral language – a dialogue between the building and the architect, occupant or deity, as well as between the parts of the building. This way architecture's language, which in the world of the senses is based on analogies and proportions, will be transferred on paper and at the same time stored in someone's memory, as a building. Vitruvius believes that this is how he could create the solid, 'crystal-clear' sentences necessary to 'condense' and 'express' architecture's 'authorities' and concrete nature.

But this language 'on architecture' has to serve another necessity. Vitruvius' audience is not only the architects who are already familiar with the *language* of buildings, their proportions, analogies and compositional principles. *The Ten Books on Architecture* refer to more or less every citizen, without specialised knowledge. Vitruvius continues: 'and no less emphatically, because I have observed that the city is thronged with people wholly engrossed in their business, public and private, I have decided that it is better to write concisely, so that people reading in their restricted leisure time understand these points quickly'.

Once Vitruvius stresses the problem of writing 'on architecture', its difficulty as well as his audience, he goes on to provide a method which could produce such a 'crystal clear' piece of work:

> Pythagoras and those who followed his sect decided to write down their precepts using the principle of cubes; they thought that two hundred sixteen lines constituted a cube and that there ought to be no more than three cubes in a single written composition.
> [Book V, preface, 1-4]. Now a cube is a body, squared all round, made up of six sides whose plane surfaces are as long as they are wide. When it is thrown, the part on which it lands (so long as it remains untouched) preserves an immovable stability; the dice that players throw onto the gaming board are like this. The Pythagoreans seem to have taken the image of the [literary] cube from dice, because this particular number of lines, landing like dice on any side whatsoever, will there produce immovable stability of memory. The Greek comic poets divided up the space of their plays by inserting a song by the chorus; defining the parts of the play by the principle of the cube they relieve the actor's speeches with these intervals.[92]

In the above extract, Vitruvius turns to the Pythagorean philosophy to look for an answer to how someone could relate a solid structure like that of the cube, and by extension that of a building, to a more intangible one like that of writing. If someone wants to commit the body of architecture to writing – as Vitruvius tried to do – they should take a closer look at 'these practices being observed by our ancestors' and look to the past. The body of architecture, like the body of the poetic cube Vitruvius describes, moves between the realm of 'solids', to which architecture belongs, and the realm of writing, where architecture has to be transferred. Memory is the key that relates the two worlds between an experience of architecture and that of text. The way you experience this Pythagorean literary cube, 'representing immovable stability', corresponds to its experience in writing where it creates also 'immovable stability of memory'. For this reason Vitruvius 'thought it best to write in short volumes in order best to reach the minds of my readers; in this way things will be readily understood.' He continues: 'I have set up the organisation of my subjects so that those seeking

[92] Ibid., p. 63.

information will not have to gather it in separate sections – instead they will have the explanations of each area of interest in one single body of text, and in individual volumes.'[93] In that sense, the body of architecture as well as the body of Vitruvius' text consists of small parts or 'solids', physical and mental ones. The *Ten Books on Architecture,* like the Pythagorean cubes described above – three of them combine to make one literary composition – could become a unified whole, a single body or book. This construction of the book(s) not only makes it easier to read but, even more important, more easily remembered and recollected for everyone, either architects or people without special knowledge or training.

According to Hersey[94] and historian Indra McEwen, Vitruvius did not employ a totally Pythagorean system but he applied a similar one to the parts of the Greek temple he analysed. I believe that Vitruvius' concern was first to lay out all the possible ways someone could write on architecture; and second, he tried for his own text to move between the two different styles he identifies, the 'historic' and the 'poetic'.

Writing for Vitruvius is very important and comes first on the list of things in which the architect should be trained. The list also includes drawing, geometry, history, philosophy, medicine, music, law, astrology and astronomy.[95] Vitruvius suggests that the reason why an architect should be trained in 'writing' (*litteras*) is so that 'he can produce a stronger memory in commentaries'. According to McEwen, Vitruvius 'does not specify who or what is to achieve a stronger memory through such

[93] Ibid.
[94] Hersey, *Pythagorean Palaces,* p. 21.
[95] 'He [the architect] should know writing, be skilled in drawing and trained in geometry. He should be able to recall many histories, listen carefully to philosophers, not be ignorant of medicine, know music, remember the responses of jurisconsults, and be well acquainted with astrology and the order of the heavens.' Translation by McEwen. McEwen, *Vitruvius*, p. 17.

writings (the architect or his work?) or whose memory is at issue (the architect's? public memory? the memory of posterity?)'.[96] But if Vitruvius has in mind 'memory' as a practice, similar to the practice of 'writing' or 'architecture', then he doesn't really have to specify whom or what this memory refers to. It is very likely that Vitruvius was aware of mnemonic practices because, as McEwen also notes later in her book, he was very well acquainted with the work of Cicero Marcus Tullius (106–43 BC), a key figure for the art of memory and the one who added memory to the list of subjects in which orators should be trained. According to Cicero and his development of the art of memory in his book *Ad. C. Herennium*:

> [Book III, XVII] For the backgrounds [for memory] are very much like wax tablets or papyrus, the images like the letters, the arrangement and disposition of the images like the script, and the delivery is like the reading … I likewise think it obligatory to have these backgrounds in a series, so we may never by confusion in their order be prevented by following the images – proceeding from any background we wish, whatsoever its place in the series, and whether we go forwards or backwards – nor from delivering orally what has been committed to the backgrounds.
> [Book III, XVIII] For example, if we should see a great number of our acquaintances standing in a certain order, it would not make any difference to us whether we should tell their names beginning with the person standing at the head of the line or at the foot or in the middle. So with respect to the backgrounds. If these have been arranged in order, the result will be that, reminded by the images, we can repeat orally what we have committed to the backgrounds, proceeding in either direction from any background we please. That is why it also seems best to arrange the backgrounds in series.[97]

Here, Cicero not only describes memory and how it operates but also gives directions to the student of rhetoric as to how to master and use it. He explains how to use images and backgrounds, and distinguishes two different kinds of memory: the 'natural' and the 'artificial', memory as a natural human characteristic and memory as a trained discipline, one related to the other. Cicero also differentiates the memory of 'words' to the 'memory of matter', the imprinting on backgrounds of images like

[96] Ibid.
[97] Marcus Tullius Cicero, *Ad C. Herennium, De Ratione Dicendi. Rhetorica Ad Herennium*, trans. Harry Caplan (London and Cambridge: William Heinemann, Harvard University Press, 1954), pp. 211–13.

'wax tablets', where images operate like the letters of the alphabet. According to Cicero, this process provides a great advantage: that someone can re-arrange and move through *memory of matter* and these images in various directions. Cicero not only provides memory with material qualities but also claims that it has 'regions'[98] that can be measured, giving to 'memory of matter' dimensions like physical space.

Vitruvius possibly considers – within Cicero's theoretical context – that 'writing' can produce 'stronger memory on commentaries' because these could be stored by the architect or any other reader – as by the orator – in the material of artificial memory. These commentaries could be translated and experienced in a solid, concrete way through memory, like a building or a city, a method that is very suitable to architecture's nature. Although this is speculation, there is a strong relation between geometric narratives like the palindrome and 'mnemonics', according to which books can be experienced like buildings or cities within someone's memory (this will be examined later). What is important, for now, is that Vitruvius perceives writing as being as fundamental as drawing, an active practice for the architect; not only as a way to talk about or to describe buildings, but as a design tool able to express architecture's solid character – something he is trying to demonstrate with his own text.

A Pythagorean technique of writing, as Vitruvius testifies, has some advantages: it is able to provide 'crystal clear' literary entities (or solids) that can combine in a whole and it is easy for the mind to 'rest', to remember and recollect. Similarly in 'writing on architecture', as in 'cubic poetry', these compositional Pythagorean techniques – which could easily be applied to buildings – have the ability to define the parts of the whole, create intervals for the readers/occupants to rest their

[98] Ibid.

mind, and facilitate their memory. The experience of this 'writing on architecture is through the disciplined practice of artificial memory.

But although the Pythagorean system serves the solid nature of architecture and possibly links real to literary 'bodies', it is not the only way to write on architecture; there is also history's example, which is possibly more engaging and does not require a specially trained audience, and which has to do with the kind of memory defined by Cicero as 'natural memory'. Vitruvius' book, above all, is dedicated to the Emperor Caesar, who is not an architect, and refers to all those with an interest in architecture at a very architecturally active period. These are the members of a Roman elite responsible for urban projects, planning and commissions, and possibly clients, who at their leisure time from Rome's demanding political and social life could read the book, and picture and decide about the typology and style of public and private buildings, using it more or less like a contemporary catalogue of buildings, materials, decorations and other architectural features.

However, 'history' for Vitruvius was not meant as a true record of events but as a testimony or record of 'the true', which was hardly real at all but an expression or a judgement.[99] Possibly Vitruvius was less concerned about the accuracy of his historic account of reality than with creating a reality by designing and decorating his book as he would do a building. Vitruvius' stories, or 'historic' style, operate like the ornaments of the temple, not necessarily as records of real events but as narratives of reality; similarly to a building or a temple where the architect is less concerned to record reality than to elaborate 'truth', and crystallise it for the centuries to come – a 'truth' that is solid but at the same time ever changing, open to a multiplicity of

[99] McEwen, *Vitruvius*, p. 58.

readings and interpretations, as in a building or more specifically the decorations and sculptures of the ancient Greek temple.

When Vitruvius creates the body of architecture moving between the historic and the poetic styles, he is aware that he has to serve more than anything else 'the truth', which is the final object, incorporating also *lekta* (or incorporeals) in the form of stories and myths that serve his objective, to write the body of architecture. The 'historic' style is more linear and easier to recognise in his long descriptions and poetic images based on tradition and myth. Let's take the example of the Corinthian order. This *historic* style of writing is recognised in the description of the invention of the Corinthian capital:

> This, so it is recorded, is how the capital was first invented. A virgin citizen of Corinth was just ripe for marriage when she was overcome by disease and died. After she was buried, her nurse filled a basket with things [*pocula*: literally, small cups or vessels] that had delighted the virgin when she was alive, brought it to the tomb, and placed it on top. Then, so that the things in the basket would last longer in the open air, she covered it with a tile. As it happened, the basket was placed on the root of an acanthus plant. After a time, in the spring, because of the weight pressing down on the middle of it, the root put forth leaves and small stalks which grew up around the sides of the basket. Because of the weight of the tile, the ends of the stalks were forced by necessity to curl back into volutes at the corners.
> Then Callimachus, called Catatexitechnos by the Athenians because of the refinement and skill of his marble carving, passed by the tomb and noticed the basket and how tender the leaves growing up around it were. Delighted by the freshness of this new form, he used it as a model to make columns for the Corinthians, established their symmetries, and assigned the rules for completing works of the Corinthian order.[100]

In the above passage it is difficult to distinguish what is 'true', and it is very unlikely that the invention of the Corinthian order happened like this. As McEwen argues, Vitruvius believed that the Corinthian style was the most adequate to express the grandiose ambition of the Roman Empire and signify its rebirth, future establishment

[100] Vitruvius, *Ten Books on Architecture*, p. 215.

and development:[101] a rebirth of an empire, exactly in the way that the acanthus grew around the basket with offerings on top of the virgin's tomb. Vitruvius does not give the same importance to the Doric or Ionic orders and is using them as necessary steps to conclude with the Corinthian,[102] which is the one he chooses for his own book and at the same time for the whole Roman Empire. The above description for the invention of the Corinthian order is definitely like describing an anaglyph, or a sculptural composition such as those decorating an ancient temple, and creates an image that is difficult to forget. But Vitruvius is trying to do something other than simply describe an image or provide a historic fact. This history or myth is more like a depiction *carved* on the paper as he would have carved it on the marble. McEwen, after a detailed analysis of writing's importance in the Roman Empire and how it operated in texts and edifices, concludes that Vitruvius at the beginning of his book writes the name of Caesar the same way that it used to be written or carved on monuments or stamped on coins. Trying to get authority for his work, which is neither history nor poetry, Vitruvius decides to use the language of inscriptions and carves the name of Caesar on the *Ten Books on Architecture* as if it were a building or a monument:[103] an action of an architect who has to write on a different material and use the language of 'history' and 'poetry' not for buildings and inscriptions but for a book.

The Pythagorean techniques and the texts' transposition to the realm of mathematics and geometry to serve the solid reality of the building occurs when Vitruvius is using more technical terms, for example when he describes not the

[101] McEwen, *Vitruvius*, p. 220.
[102] 'This means that everything he [Vitruvius] said about Ionic columns in Book 3 applies to the Corinthian ones, leaving the reader beginning Book 4 with the distinct impression that Vitruvius has been leading up to the Corinthian order all along.' Ibid., p. 222.
[103] Ibid., p. 36.

origins of the Corinthian order but the order itself, its proportions and analogies. The language used when he describes the Corinthian capital recalls more of the Pythagorean theorem and is based on proportions and analogies that are described or drawn with the use of writing:

> This is how to achieve the symmetry for this [Corinthian] capital: whatever the diameter of the base of the column, the same unit should be the height of the capital with its abacus. The width of the abacus should observe this principle: whatever the height of the capital will be, there should be two diagonals of that length from one corner [of the abacus] to the other. In this way each face of the capital will have a properly proportioned appearance. Each of these faces should curve inward from the corner of the abacus by one-ninth the breadth of its face. The bottom of the capital will have the same diameter as the top of the column, not including its apophysis and astragal. The height of the abacus is one-seventh the height of the capital …[104]

These two sets of images and descriptions – on the one hand the history/myth of the order, and on the other the proportions and analogies – complete the whole body of the Corinthian capital. To relate this to the traditions of Orpheus and Pythagoras, within the *Ten Books on Architecture* we witness the use of language both to reveal poetic and mythical images and to create a more abstract geometric experience of reality. It is significant to note that Vitruvius himself prefers to use writing rather than illustrations to create the body of architecture. Vitruvius believes that the most adequate tool at his disposal to create the body of architecture is writing and the text itself. He generates images and explores the way these could be manipulated by the mind by using historic solid 'truths' as well as more abstract, but still solid, structural mathematical/geometrical ones. To compare with the terms of this research we could see spatial palindromes as the Vitruvian historic style and palindromic space as the poetic one; one refers to the spatiality of the palindrome in books and architecture and the other to the actual structure and experience of this space. Vitruvius example is

[104] Book IV chapter I.11. Vitruvius, *Ten Books on Architecture,* p. 55.

very significant for this theses because demonstrates clearly such a distinction and how it operates in both writing and architecture.

Both styles combine. The descriptions of analogies and proportions and the descriptions of stories and myths could work in a complementary way and create the mythical and geometric narrative of the book, like a building. They could create a textual scaffold made of proportions and analogies, similar to the Pythagorean literary cube, upon which could be placed stories and myths, all of them together experienced by memory, 'natural' and 'artificial', like a building. As with his descriptions of the temple, analogies, proportions, myths and stories become the temple itself, all of them working together as a whole, as a building.

Possibly all the different versions of the *Ten Books on Architecture* – almost each period has an illustrated version of them – show finally how successful Vitruvius' writing was at serving such a belief in corporeal 'truth' in its multiplicity. The *Ten Books on Architecture* remain alive and ever changing as a point of reference for every period, standing between antiquity and Rome and moving from there to the Renaissance, Classicism (when it was seriously questioned) and up to the present. The books' signifiers are multiple and constantly shifting within themselves and within time.

Vitruvius at the very beginning of his book writes: 'These two things are contained in all matters, but above all in architecture; that which is signified and that which signifies. What is signified is the matter set forth by what is said. What signifies this is a demonstration developed through the principles of learning.'[105]

According to a Roman theory of signs, for rhetorician Quintilian (Marcus Fabius Quintilianus, c. 35–c. 100) and Cicero as well as Vitruvius, every *oratio*

[105] McEwen, *Vitruvius*, p. 74.

consists of signifying *verba* (words) and signified *res* (matter).[106] The relations between *verba* and *res* are goverened by *ordinatio* (order), *dispositio* (arrangement), *eurythmia* (good rhythm) – more or less the same rules (analogy, proportion) that Vitruvius considers to relate or connect architectural elements and to create the building. In contrast to the orator who employs elements from the city and architecture to create his argument and store it within artificial memory, Vitruvius is doing the opposite and applies the art of rhetoric to the city and architecture, mediated by memory. Vitruvius plans his book as a building, and constructs the signified matter (*res*) and arranges images as well as their spatial geometric order in his reader's memory; his aim is not to represent or imitate the existing things but instead to demonstrate by signs the external reality of architecture and, in this way, create a building that becomes part of life and reality itself.[107] The building, in memory, book or reality, has to follow the rules of good rhetoric and those of the art of memory: *invention* (thought up), *distributio* (properly arranged), *elucatio* (well said), *action* (delivered). Cicero once claimed that he could not make a proper argument indoors, away from the repository of signifiers that was the city with its buildings: 'one can use words [Cicero said] to reply to an argument made with words. But how does one reply to the self-evident *fact* of a building?'[108] This repository of signifiers that is the city needs its signified material to be expressed; words cannot stand by themselves and their body needs to be moulded in matter – as matter needs words – otherwise they cannot speak, or at least cannot speak the same. This is the reason why Vitruvius claims that 'architecture [the *external reality*, *tynchanon*, or *truth*] above all is the

[106] Ibid., p. 81.
[107] According to a ritualistic signification where things did not represent but showed by signs; like the kolossos example analysed by Vernant. Jean Pierre Vernant, *Myth and Thought among the Greeks* (New York: Zone; London: MIT [distributor], 2006).
[108] McEwen, *Vitruvius*, p. 82.

repository of signifiers and signified matter',[109] and he positions writing first on the list of the architect's education, because more than anyone else the architect has to move from body to body and from matter of words to *external reality* and vice versa.

Summarising all the above, the 'temple' stands for a signifier of the *existing reality*,[110] being for example the god's or goddess's residence or a manifestation of his or her existence, and it is like an argument, an expression, a *demonstration developed through the principles of learning*, and has a body like *external reality* itself or the divine presence (it does not imitate or copy reality but demonstrates by signs). The book or the building written on paper or carved on marble is a signified or a description [*Lekton*] of the external reality's 'truth', or of the signifier it stands for – *the matter set forth by what is said* – and contains the argument as the built temple contains the 'temple'. The book or the temple being a signified is easier to store or transfer[111] onto either paper or marble or into someone's memory as long as the rules of rhetoric are followed [analogy]. And memory for the Roman theory of rhetoric has a materiality similar to paper or marble, operating as a wax tablet, like the orator's paper or the architect's marble. Memory has also a spatiality within which the 'temple' or the argument can be formed or moulded. The book and the temple as a signified is a *lekton*, has no body by itself (has to borrow one to manifest itself) and is *described* in marble, paper or memory, which means that consequently it could be transferred more easily, but at the same time erased and rewritten or just lost and destroyed. Matter does not exist without word as word without matter, but *existing reality* is more concrete, and as the word denotes [tynchanon] has a randomness of appearance based on its description (of what is experienced as reality). According to

[109] Ibid.
[110] External reality is the space where gods lived and is related to the space of the myth as well as to the more abstract geometric space of reality expressed by Anaximader or Pythagoras.
[111] Hersey, *Pythagorean Palaces,* p. 21.

the Stoics, *lekta* like void, place and time, are 'incorporeals',[112] a concept that relates the book's signified matter to the void – something we will see also later in Mallarmé's *Un Coup de Dés*.

Palindromes, according to the above theory, are words that could have an expression in paper, building or someone's memory, and in each case demonstrate the 'distributio' [proper arrangement] of mirrored symmetry. As an argument (*oratio*), palindromes provide an independence of direction of movement represented both in books and in buildings, such as in poems, domes and fountains. According to Jean-Pierre Vernant (1914–2007), a French historian and anthropologist, in antiquity there is a distinction between movement in mythical and in geometric space. In mythical space movement is not independent but is based on 'opposing religious meanings'[113] and is linear. Anaximander (c. 610 BC–c. 546 BC) was the first to suggest a geometric 'homogenous space [placing earth in the middle], constituted by symmetrical and reversible relations', where 'absolute value is no longer attached to the directions of space'. Palindromes could be seen as such a description (words) and demonstration (matter) of such an idea of geometric space because either in paper or stone they are structured around such a symmetrical and reversible, homogenous space with an independence of movement (defining a 'harmonic region'). Movement in palindromes is cyclical where there is no 'absolute' value to the 'directions of space', and this is why they used to be written cyclically on fountains or domes. But palindromic time is also cyclical as it is not governed by one-way direction (past–future) but could be

[112] '*Lekta* are not bodies. Like void, place and time, *Lekta* are what the Stoics called "incorporeals". *Lekta*, things signified, mediate between the words of significant utterances and existing things.' McEwen, *Vitruvius*, p. 77.
[113] He [Anaximander] proposes not a mythical space, where up and down and right and left have opposing religious meanings, but a homogeneous space constituted by symmetrical and reversible relations … absolute value is no longer attached to the directions of space.' Vernant, *Myth and Thought among the Greeks*, pp. 201–2.

reversed (past–future–past), and this is why palindromes were used in fountains in relation to water, which represents a circular movement of time or a flow of form independent of direction (no matter if it is future or past, water will always be water coexistent in all of its forms), a cyclical conception of time like that of Nietzsche's eternal 'Return of the Same'.

But let's move to Vitruvius' book, the *Ten Books on Architecture*, and examine how it is structured. McEwen, in her analysis, argues that Vitruvius is not trying to write about architecture, describe buildings or create a compilation, but is writing *on* the body of architecture, which is by extension the body of the Roman Empire. Vitruvius consistently uses the word *corpus* (body) to describe his work, which might sound familiar to us now but such a use does not predate Vitruvius' contemporary Cicero.[114] Writing, according to Mc Ewen, was very important for Romans and it seems that nothing existed, not even a person or a body, without a written expression of it; accordingly, the Roman Empire needed a similar expression in written form. Vitruvius uses writing to create the body of architecture, for all the reasons described, and also chooses his methodology to express this body following the laws of rhetoric. Possibly Vitruvius was the first who tried to commit the body of architecture to writing, but it seems that the opposite existed: an architecture of the body, whose purpose was to impress the reflections of *external reality*'s absolute truth or 'architecture' itself on the signified material. If Vitruvius is trying to collect the scattered pieces of architecture in one volume (body) it is because he is trying to act as an architect and not as a historian or a poet: a similar practice to that of the architect who was commissioned to build the shrine at the spot where ended the singing head of Orpheus; a practice which was an act to collect the scattered pieces in

[114] 'It is common enough to speak of a "body" of written work today, but in Latin the use of *corpus* to refer to a written work does not predate Cicero.' McEwen, *Vitruvius*, p.9.

the world and re-create the dismembered body of the Thracian poet. In ancient Greece abstract concepts like Democracy, Eros or even the city of Athens were offered a body based on the human one, and it seems it was the task of the architect to express it in space, as of the sculptor to express it in marble,[115] and by using mythical and mathematical narratives to transfer a physical and emotional unified experience (like Valéry's example in the introduction). The theatre, for example, was a way to gather the pieces of the dismembered body of Dionysus, and each temple was similarly a theophany of a divine body, a body that in ancient Greece is as close as possible to the human one, physically or emotionally. Vitruvius as an architect has to collect the scattered pieces of an enormous Roman Empire to create its body, using as his signified matter, instead of the building, the book. Not only do the *Ten Books on Architecture* collected in a single volume stand for the body of the Roman Empire but at their heart resides the human image based in symmetry and proportion, as in the temple. Vitruvius[116] describes or inscribes man, as he does the name of Caesar, in the space of the book, building and space of 'artificial' and 'natural' memory.

Vitruvius writes in his Book III, chapter I the 'First principles of symmetry':

> 1. The composition of the temple is based on **symmetry**, whose principles architects should take the greatest care to master. **Symmetry** derives from **proportion**, which is called *analogia* in Greek. **Proportion** is the mutual calibration of each element of the work and the whole, from which the proportional system is achieved. No temple can have any compositional system without symmetry and proportion, unless, as it were, it has an **exact system of correspondence to the likeness of a well-formed human being**. [emphasis added]

[115] In ancient Greek sculpture is *agalma*, which could be translated also as a shrine. 'Cornford has embodied the true spirit of the word *agalma* by translating it as a "shrine". The shrine is the cosmic prototype of the Temple, and this aspect of the created cosmos is again clarified by Proclus.' Critchlow Keith, 'The Platonic Tradition on the Nature of Proportion', in *Homage to Pythagoras: Rediscovering Sacred Science*, ed. Christopher Bamford (Hudson, NY: Lindisfarne Press, 1994), p. 149.
[116] 'Vitruvian man is not *produced* by geometry like the entasis of a column or an Ionic volute. As Vitruvius describes him, *the man is geometry's source.*' McEwen, *Vitruvius,* p. 157.

2. For nature composed the human body in such a way that the face from the chin to the top of the forehead and the lowermost roots of the hairline should be one-tenth [of the total height of the body], the palm of the hand from the wrist from the tip of the middle finger should measure likewise … The other limbs, as well, have their own commensurate proportions, which the famous ancient painters and sculptors employed to attain great and unending praise.[117]

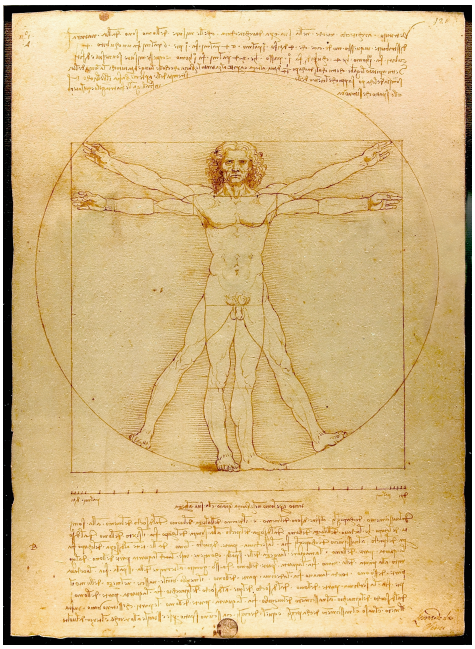


Figure 25 Leonardo da Vinci, Vitruvian man or the *Canon of* Proportions. Gallerie dell' Accademia, Venice, 1487.

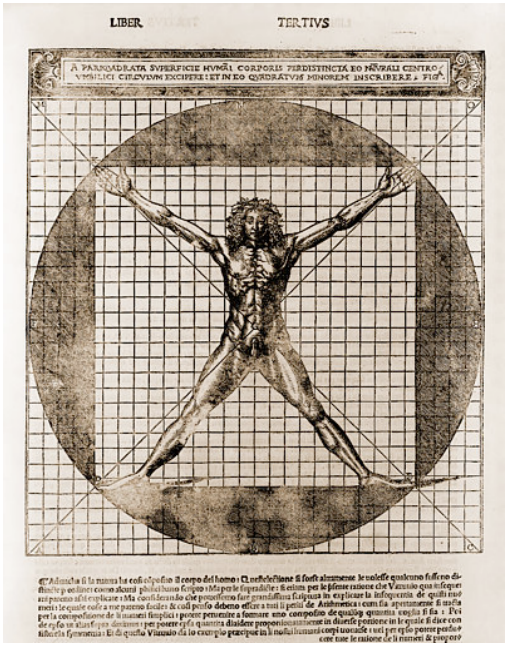


Figure 26 Cesare Cesariano, Vitruvian man. From Marcus Vitruvius Pollio et al., *Di Lucio Vitruuio Pollione De Architectura Libri Dece Traducti De Latino in Vulgare Affigurati: Comentati (Da Caesare Caesariano),* Como, 1521.

Architect Marc Wilson Jones has drawn relations between the above description, Leonardo's drawing of the Vitruvian man (fig. 25, 26) and a metrological relief recently discovered in Salamis, Greece, (fig. 27) which he then relates to antiquities' buildings, including the Parthenon.[118] According to Jones, units of measure that seem to derive from the human body are reflected onto buildings, sculptures,[119] drawings and by Vitruvius' example onto text. The image of the man on the relief and the other

[117] Vitruvius, *Ten Books on Architecture*, p. 47.
[118] Mark Wilson Jones, 'Doric Measure and Architectural Design 1: The Evidence of the Relief from Salamis', *American Journal of Archaeology* 104, no. 1 (2000): 73–79.
[119] Jones draws relations with the sculpture of God found in the sea at Artemision Effesus (around 460 BC), and claims there is a one-to-one relationship to Vitruvian man. Ibid.

example of Oxford's metrological relief[120] (fig. 28) are above anything else a measure for the builders, technicians and sculptors, but depicting the human body in stone also shows how this body could be transferred to the building, its ornaments, sculptures and within text about the temple. Such a system, apart from its practical use, is also a way for measurement and analogy – according to the theory of Greek antiquity and Rome – to transfer onto the signified matter the *external reality* and accordingly imprint, for example, the idea of the city of Athens in the Parthenon (body of Athena) or the idea of the Roman Empire into Vitruvius' *Ten Books on Architecture.* Such a plate was possibly placed into the Athenian Agora[121] for everyone to use, and has the ability to translate both the abstract geometric space and the mythical one[122] and be a measure for both the builder and the artist. The body on the Salamis plate is dismembered, showing not only antiquity's different metric systems but, like the Orphic or Dionysian body scattered in the world, the diversity of *external reality*'s (tynchanon) signifiers, or by extension language anagrams' cannibalistic nature. Vitruvius, like the sculptor who carved the Salamis relief, uses words (signifiers) and memory as his material (signified) to provide the metric system necessary to 'build' his buildings within the book – using words in the geometric or the mythical way as mentioned before in the example of the Corinthian order – and places his 'man' in

[120] The metrological relief is part of the Ashmolean Museum's collection, Oxford. According to the museum's website: 'Scholars disagree as to the use to which our relief was put. Some have held that it was set up in a market place so that people could check standard units of measurement. The more widely accepted view is that it was set up over the colonnaded portico of an official weights and measures office. We hear of officials called *Agoranomoi*, or clerks of the market.' http://www.ashmolean.org/ (accessed 12 September 2008).

[121] 'It is reasonable to suppose that our slab was only a shadow of similar reliefs displayed in the Athenean agora.' Jones, 'Doric Measure and Architectural Design 1: The Evidence of the Relief from Salamis', p. 85.

[122] '…it has been argued that the Oxford metrological relief had a primarily symbolic and decorative function'; later Jones argues that such prospect is less possible for the Salamis relief, or at least for it to have such a primary function. Ibid., p. 80.

common view for the Roman Empire, and maybe at the same time sets up his own measure or metric system for the book itself as a whole.[123]

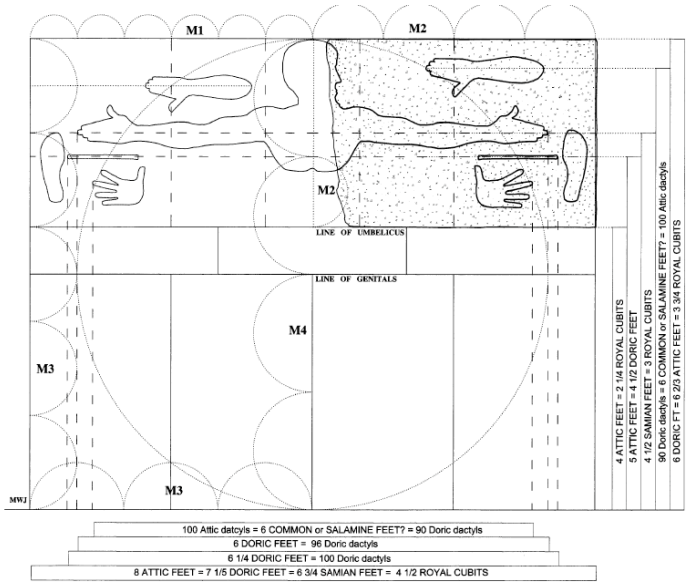


Figure 27 The Salamis relief and a reconstruction by Mark Wilson Jones. From Mark Wilson Jones, *American Journal of Archaeology*, 2000.

Figure 28 Oxford's metrological relief between around 460 and 430 BC. Ashmolean Museum, Oxford.

But how does Vitruvius bring together the scattered pieces/members of architecture's body? First of all the *Ten Books on Architecture* is not only one book; it is made up of ten books. We could call them sections, but for Vitruvius it is clear that they are independent books, all working both separately and to create a unified body, which reflects the human one and at the same time is the body of the Roman Empire. As McEwen notes, the process of reading the *Ten Books on Architecture* was very different from what we experience now and from the numerous translations. The book(s) were not meant to be read linearly from left page to right or from Book I to Book II, and so on, as happens in all the available editions. The *Ten Books on Architecture* were ten cylindrical scrolls, (fig. 27) which had to be unrolled in order to

[123] 'At once a metaphysical proportion and a ritual formula, Vitruvian man is also and above all the architect's template.' McEwen, *Vitruvius*, p. 181.

be read, and there was no sense of continuity as with reading a book with a beginning or an end, a first and last page; for example, the second book didn't start at the end of the first one. The ten scrolls consisted of one entity but at the same time were different objects, or 'discrete tactile units',[124] identical – which means that they could be scattered around, misplaced, lost, read in a varied order, and in different contexts or times, depending on desire, chance or just randomness, like throwing dice. As there was no binding, Vitruvius had to find a way to collect or keep tight together the scrolls, members of the book, like an architect who had to keep together both physically, structurally and mythically the different parts of the building. Proportion, analogy (analogia) and symmetry is the suggested force that keeps textual space together and creates the unified experience, just as in a building – as in architecture when, according to Vitruvius, 'the composition of the temple is based on symmetry … which derives from **proportion**, which is called analogia in Greek'. These forces don't operate only within each one of the books to provide it with the argument based on the laws of good rhetoric (analogy) but are also applied to the book as a whole to keep its dismembered parts together.

The number of the books, ten, wasn't decided randomly: as McEwen argues, it is based on Pythagorean theory. According to Pythagoras, ten is the perfect number, which derives directly from the human body and which binds also with nature. The solids in Pythagorean theory need four points to be constructed, which are expressed with the tetraktys (fig. 30), consisting of ten points or pebbles. It has been mentioned already that although Pythagorean philosophy offered a level of abstraction there was still something left from the values numbers used to represent – pebbles for example. The number ten was not only considered to be able to construct the world but was also

[124] Ibid., p. 132.

called by Pythagoras *mneme*,[125] or memory, and considered to be 'the container and content of time itself'.[126]

Figure 29 Indra McEwen, 'Plaster, wood, and surgical gauze model of *De architectura*'. From *Vitruvius,* Cambridge, 2003.

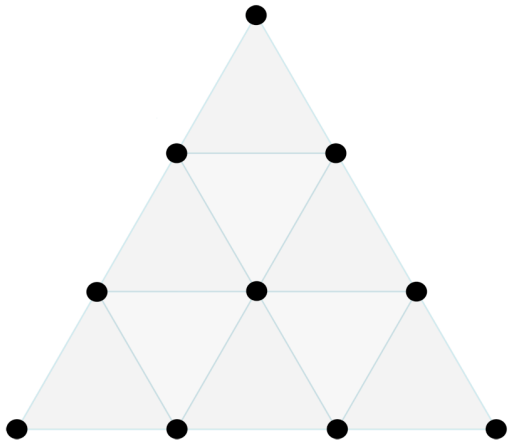


Figure 30 The Tetraktys. Produced by author.

But how could analogy and symmetry bring together such a body which is created by separate parts/solids? Plato, in *Timaeus*, writes: 'From such constituents, four in number, the body of the universe was brought into being, coming into concord by means of proportion' (*Timaeus* 32c).[127] Like a philosopher who is speculating on the relations between solids and the creation of the universe, Vitruvius, the architect, is using philosophy to bring together the body of architecture with the body of the Roman Empire. Not only is philosophy in Vitruvius' list of things the architect should study, but he himself was very well acquainted with philosophy's enquiries in his period and with Plato's work. Some books are dedicated to famous thinkers and writers of antiquity, and there are also direct references to Plato, for example in the introduction to Book IX. Plato, in *Timaeus*, gives an account of how the universe is

[125] Ibid., p. 46.
[126] Ibid., p. 47.
[127] Keith, 'The Platonic Tradition on the Nature of Proportion', p. 138.

being built by the four elements (fire, air, water, earth), which are represented by the ideal solids (tetrahedron, octahedron, icosahedron, cube). The relation between these solids based on analogy and symmetry is what creates all the bodies and by extension the universe itself, or the body of the Roman Empire in Vitruvius' case, and their geometric relations.

It is important to clarify here that in antiquity geometric solids have bodies and qualities of soul based on the human body and the human image. Vitruvius, following a Pythagorean and Platonic method to create the body of architecture, decided to write ten books on the arrangement of the tetraktys, four rows consisting of ten scrolls, setting up the analogy between the books as he would do with the parts of a building. Plato, in his cosmology, claims that out of four constituents 'the body of the universe was brought into being', which is not only the four solids and their analogical relations but also how the elements of nature (fire, water, air, earth) relate.[128] Nowadays, of course, we know that the elements are more than four (periodic table), but the main concept is very similar as all objects consist of atoms and the bonds between them. The tetraktys demonstrates that you need at least four points to move from the point to the realm of solids and to space. One represents the point, two points the line, three the plane and four the solids, as you need the minimum four points to give the co-ordinates of a spatial object (the tetrahedron, for example). The tetraktys, comprising ten numbers, points, pebbles arranged in four rows, also shows that the number four could be expanded to the number ten, which is the sum of its parts (1 + 2 + 3 + 4 = 10) and is related to the human body (ten fingers). Also, for the Pythagoreans the cosmos is constructed from ten pairs of binary oppositions.

[128] Vitruvius himself writes in the introduction to Book VIII: 'But Pythagoras, Empedocles, Epicharmos, and the other naturalists and philosophers proposed that the first principles of matter were four: air, fire, earth, water, and that their adhesion to one another by natural formation creates the qualities particular to each type of substance.' Vitruvius, *Ten Books on Architecture,* p. 96.

Both Plato and Vitruvius decide to use writing instead of drawing to describe abstract or architectural space and spatial relationships between elements, not because there were not available other means such as, for example, drawing, but because they seem to believe that text – instead of image – is the most suitable tool for their purpose; possibly because of the multiplicity of its signifying power to represent reality.

Vitruvius follows the laws of tetraktys, not only to structure the book as a whole body (fig. 31), but I believe also to distribute the subjects within the structure he proposes and give the spatial co-ordinates of each one of them (fig. 32). Book I is the *First Principles and Layout of Cities*, Book II *Building Materials*, Book III *Temples*, Book IV *Corinthian, Doric, and Tuscan Temples*, Book V *Public Buildings*, Book VI *Private Buildings*, Book VII *Finishing*, Book VIII *Water*, Book IX *Sundials and Clocks*, Book X *Machines*.

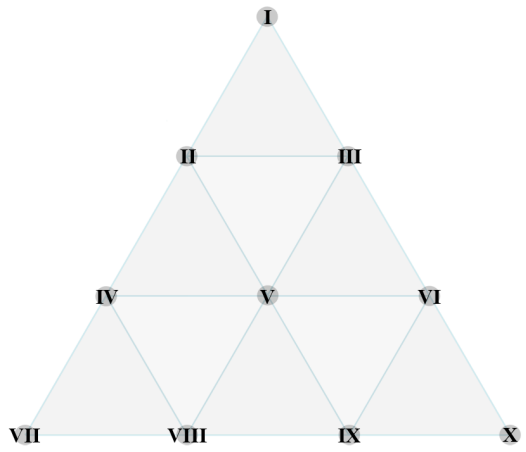


Figure 31 Hierarchical arrangement of the *Ten Books on Architecture*. Produced by author.

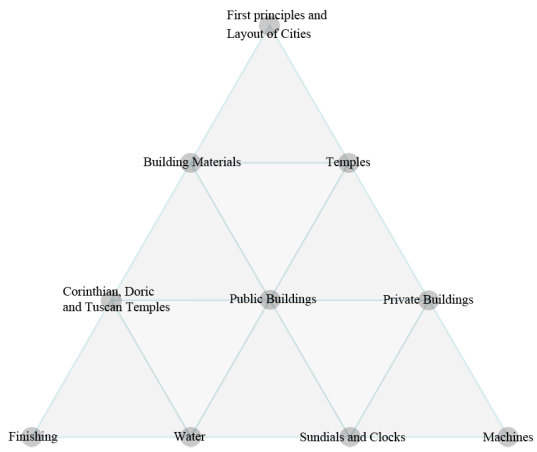


Figure 32 Distribution of contents in *Ten Books on Architecture*. Produced by author.

On the top of his Pyramid, in Book I, Vitruvius writes about the principles of architecture, which include education, terms, divisions of architecture, allocation of site, orientation and general information that mostly defines the fundamental qualities of architecture. Vitruvius provides the body of architecture with its basic principles,

like the qualities inherited within the tetraktys' point (or the principles of number 1), which when combined could create the cosmos. Books II and III refer to building materials and temples in a more detailed way: Book II to the invention of arts and architecture, the story of the first hut, different materials and how they could be used; and Book III to the principles of symmetry, species of temples and how they were made. Otherwise, these books refer to the appearance of things or the visibility of architecture and, in relation to tetraktys, how the principles inherent in the bodies could combine to start making the world visible: two points (number 2) draw the line, which is the first visible element of the cosmos. Books IV, V and VI seem to be the main part, 'body', of Vitruvius' book, where he refers to particular things, the Corinthian, Doric and Tuscan temples, public and private buildings. In this part, Vitruvius moves from the appearance of things to the things themselves, includes more specific descriptions and concludes with the Corinthian order, talking about public buildings such as theatres, baths, palaestras and ports, and private buildings such as interiors, houses and their orientations. Here, he becomes, more specific and draws the plans of the buildings by using words; in the tetraktys order, he moves from the line to the plane three points (number 3) describing the things themselves. Vitruvius could easily have combined the two chapters on temples into one (instead of dividing them between Books III and IV) but, as he claims at the beginning of Book IV:

> In the third volume, then, I offered instruction about the design of temples, and about the variety of their types, which species they have and how many, and what the distribution of the various components ought to be according to type. Of those three types whose proportions exhibit the most intricate modular systems, I taught the conventions of the Ionic. Now, in the present volume, I will speak about what have been set up as the Doric and Corinthian principles.[129]

[129] Ibid. p. 54

The above extract demonstrates that, for Vitruvius, the Ionic order is not as important as the other ones and its use is more descriptive, belonging to the general analysis about temples and not to the specific cases where Vituvius places only the Corinthian, Doric and Tuscan temples. Even the way Vitruvius entitles the chapter about the Ionic order 'Ionic Column Bases, Capitals, and Entablatures' makes it clear that the Ionic does not constitute an order by itself but operates as an example to provide general descriptions of temples. The Corinthian order is the centre and main part of his Book IV, and seems to be the most adequate to describe the Roman Empire and indeed becomes the representative order for the Roman architecture. The final chapters of the *Ten Books of Architecture* are Book VII *Finishing,* Book VIII *Water,* Book IX *Sundials and Clocks* and Book X *Machines*. It is worth noting here that Book VII is the one entitled *Finishing*, rather than Book X, as would have been expected from a linear structure. The concluding book is the first of the last sequence of four books, demonstrating that all of these books (VII, VIII, IX, X) belong to the same wider section and that all of them in a way are finishing or concluding books. According to the tetraktys, the base of this triangular sequence is what represents the solids because you need the minimum of four points to express an object in space. But if you have the things themselves, as Vitruvius draws them in the previous books, what else do you need to make them solid, generate them in space and set them in motion? Vitruvius dedicates his concluding Books VIII, IX, X to water, clocks and machines, elements that bring life and provide motion in space and time to a frozen plan, drawing or book.

Vitruvius' own concluding words in Book X, after describing the *principles of machines*, are: 'I have assembled information about the individual types and parts of architecture, **so that the entire body of that art might have all its components**

explained in the space of ten volumes' [emphasis added]. If we deal with the *Ten Books on Architecture* as a structure arranged and ordered in space[130] then new relations and a new way of reading seem to emerge. We can start placing subjects and themes differently than in a linear progression and the text becomes more than a description of architecture's orders, typologies and characteristics. The book resembles a pyramid – or a tetrahedron, because we have only four points at the base of the structure and one at the top, no matter how we look at it – created by individual elements and the bonds or forces of symmetry or analogy between them. The subjects, topics and themes move from the top to the bottom, but their sequence could change at any time, so we can move freely from book to book as long as we know the co-ordinates of each scroll and of each subject within. To help locate each book, Vitruvius dedicates, or inscribes, each volume to a person or to a group of people, such as Caesar (Books I and IV), Dinocrates (Book II), Socrates (Book III), Thales of Miletus, athletes, or to writers (Book IV) and even to writing on architecture (Book V). In the heart or the centre of this pyramid, beginning at scroll V, Vitruvius places the nature of the problem he is dealing with – writing *on* architecture – and suggests his methodology, providing us with the image of the Pythagorean literary cube and giving us at the same time a small clue as to how we should look at or read his book(s). In scroll III, he sets up his metric system, drawing the Vitruvian man with words and providing a measure of relations between subjects, book(s) and architecture. At the top of the pyramid Vitruvius places the more general subjects, moving slowly to more and more specific ones, from characteristics and descriptions

[130] Vitruvius at Book VII says: 'I could not remain silent, but would instead describe individual matters of architecture in individual volumes in an orderly fashion.' At Book IV he says: 'When I had become aware, Imperator that many writers had left behind them precepts and volumes of commentaries on architecture that were not set in proper order but taken up instead as if they were stray particles, I though it would be a worthy and most useful contribution, first to set out the whole of such an excellent discipline in its full order and then in each volume to explain the particular qualities of each type of subject.' Ibid., pp. 87, 54.

of buildings to the buildings themselves, and from there to the foundations of buildings as well as to the foundations of his book(s). Vitruvius draws his references from the linguistic theory of his period (Cicero, Varro) and cosmologic interpretations of his ancestors (Plato, Stoics, Pythagoras) based on the elements and the geometric analogy between them – for example, cube-earth, or the Vitruvian man, and tetrahedron-fire, or the book(s) themselves, is the combination that creates things and makes them visible – to create the body of architecture based on the 'Vitruvian' man.

Vitruvius does not only operate as an architect but also creates a non-linear, spatial narrative and a mnemonic device for the experience of his book, stimulating both 'natural' and 'artificial' memory – which, in modern terminology, could be interpreted as psychological or emotional and cognitive memory processes – and creating Orphic poetic images as well as mathematical Pythagorean ones. Books can be lost or destroyed, scrolls can be scattered or misplaced, but such orderly arrangement within memory can remain for longer and not only assist the recollection of themes and subjects, but also become the binding of the book and the force that keeps it together. Upon this pyramid grid or scaffold, someone could start slowly to build the book with images, drawings, words, and create a very important and powerful design tool, like a standing-by computer library ready to be recalled whenever it is needed. This analysis might seem like a magical or alchemical attempt to recreate the universe, but I would prefer to see it as a very likely use by Vitruvius of the theory and knowledge available, trying to create an architectural design tool. All evidence seems to point to a possibility of a spatial reading and construction of Vitruvius' books as buildings.

Temple as an Expression of Words

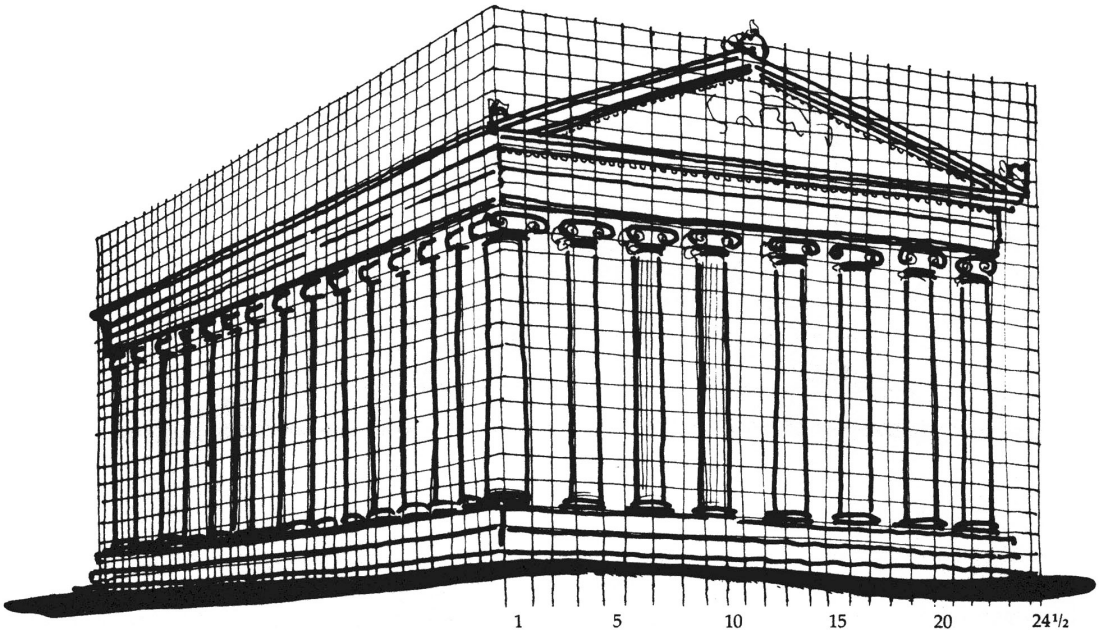


Figure 33 George Hersey, 'Temple set into a grid of Idéae'. From George Hersey, *Pythagorean Palaces*, London, 1976.

Like the spatial, orderly arrangement of Vitruvius' books, the ancient Greek temple is arranged within a spatial grid, in respect of both its structural elements and its narratives. According to Hersey, Vitruvius develops an algorithm that, expressed by words and numbers, can produce the design of the ancient Greek temple as a whole.

The palindrome could be considered as a similar 'algorithm' able to provide spatial co-ordinates for both the text, the book, and also for its expression in architecture in arches, domes, thresholds and fountains. For example, in the case of the double-headed eagle analysed in the introduction, the palindromic 'algorithm' was the mechanism employed by the poet to initially break up and then re-collect the space of the book. In this example, a similar mechanism, an algorithm, is employed to generate both a building and a book.

For example, according to Hersey, take the expression 'I want a eustyle Ionic psedodipteral octastyle temple with a module of two feet and a three step

stylobate'.[131] By providing four factors for the temple, this algorithm is able to describe any temple possible. These factors are:

1. Plan.

2. Scale that is provided by the steps.

3. Order – choice between Doric, Ionic, Corinthian and combinations of those.

4. Upright planes – a system of planes that enclose the temple within a three-dimensional grid. (fig. 33)

As Hersey claims:

> Vitruvius has constructed his Greek temple signified in the form of hierarchy. He had first arranged points, that is column bases, into a grid. He then bounds these points with a linear structure – the stereobates and its steps. Then comes the order. This constructs the four planes of the façades, which automatically produce the final result, a solid.[132]

This way Vitruvius provides a very vivid image, which is able to recreate all kinds of temples. Such a visual description could be used by the architect at the drawing desk or the site, or by any citizen of Rome who had to decide on the city's future image. This image is experienced through memory in a manner similar to the way in which the orator translates every speech using buildings. But possibly such an algorithm, or orderly arranged memory, apart from the spatial co-ordinates, scale and style of the building, provides also the spatial co-ordinates of the book; that is, how the *Ten Books of Architecture* are structured.

Combining the tetraktys arrangement suggested by McEwen, Hersey's four factors and a possible spatial arrangement of subjects within the book, we could claim that:

131 Hersey, *Pythagorean Palaces*, p. 25.
132 Ibid.

Number	Form	Signified temple	Signified book
1. .	Point (dot)	Column base	I. First principles and layout of cities
2. ..	Line (line)	Bounding step	II. Building Materials III. Temples
3. …	Plane (square)	Order	IV. Corinthian, Doric and Tuscan Temples V. Public Buildings VI. Private Buildings
4. ….	Solid (box)	Whole or grid	VII. Finishing VIII. Water IX. Sundials and Clocks X. Machines

There is a correspondence between the way Vitruvius structures the signified book and the temple. The scale, for example, given by the image of the Vitruvian man is placed in Book III, entitled *Temples*, at the same position where the *bounding step* in the algorithm of the temple is placed. According to Hersey, the step is able to give the scale of the temple because it provides human scale: the smaller the stylovates, the smaller the size of the whole temple, and vice versa. For Hersey, the grid unifies the whole structure and creates the solid image of the temple, but the grid could also be considered a machine that unifies and provides motion, and based on such a grid could be considered to be the book itself, being ten scrolls arranged on top of one another. The grid does not belong to the first section, the layout or the basis of a structure, as it is a machine or a organisational system and not the layout itself; it is closer to the world of ideas as by itself it has no material expression. As we will see

later on, other examples based on a similar system of superimposed grids are Perec's *Life A User's Manual* and Mallarmé's *Un Coup de Dés*.

According to Hersey, this algorithm does not apply to all buildings but only to temples, and Vitruvius himself does not consistently apply these principles. Nonetheless, the temple of all buildings is the one that collects the whole body of the Roman Empire into a unified whole, and the book seems to be such an expression (according to McEwen). It is also very difficult to determine whether this algorithmic system of description was invented by Vitruvius or follows the theory of the 'ancients'. A key to understanding the system of algorithmic description seems to be Vitruvius' account of the sectioned cube in Book V,[133] the system developed by the Pythagoreans and employed by 'comic poets'. Unfortunately, there seems to be a very enigmatic interpretation of that extract from the Renaissance onwards, such as Cessariano's and Barbaro's interpretations. It is not known exactly how poets used to employ this technique, which seems to be based on dividing a cube to include two smaller cubes within. Vitruvius mentions that such a text should consisted of 216 (6^3) lines, and according to Cessariano the other cubes should follow the sequence of 2^3, 4^3, 6^3 (2, 4, 6).[134] One of the smaller cubes (4^3) follows the same division of the dice, according to Vitruvius' claim and Cessariano's drawing (fig. 34), and has the ability to move within the larger cube with the randomness but stability of the dice; the text-poem following this arrangement could be seen as the dots of the dice; but also each one of the 216 lines of the main text of the 'comic poets' mentioned by Vitruvius could be represented by the 216 solids of the main cube.

[133] Quoted in the previous section, pp. 82-3.
[134] 2 is the number of duty, 4 is the first solid number, and 6 is the first perfect number. Hersey, *Pythagorean Palaces*, p. 25.

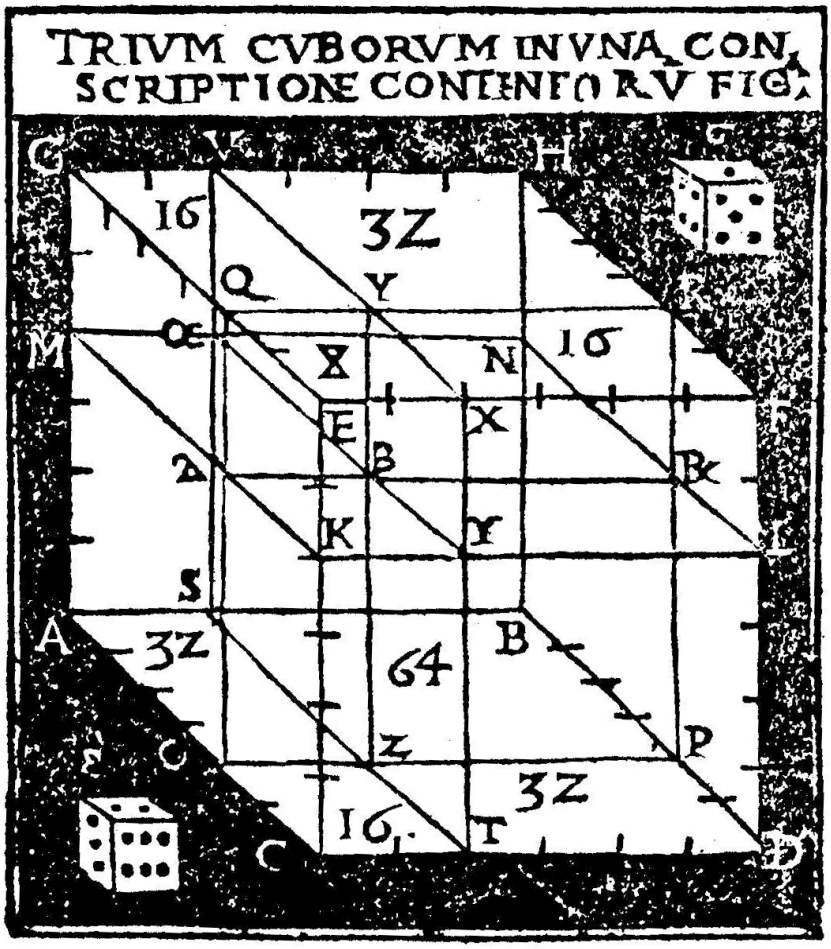


Figure 34 Cesare Cesariano, Vitruvius' literary cube. From Marcus Vitruvius Pollio et al., *Di Lucio Vitruuio Pollione De Architectura Libri Dece Traducti De Latino in Vulgare Affigurati: Comentati (Da Caesare Caesariano),* Como, 1521.

Barbaro, in his interpretation of the same passage, draws a reference between Vitruvius' description of the Pythagorean cubic text and a textual structure based on cubic sequences, which if applied to a text would produce a solid structure. Barbaro draws the analogy between form, its numerical value and its corresponding literary equivalent, and concludes by relating the *point* to number 1 and the word; the *line* to number 2 and the line; the *plane* to number 3 and the chapter; and the *solid* to number 4 and the treatise. According to Barbaro's analysis, the ideal treatise should consist of 27 (7 + 9 + 11) books, 64 (13 + 15 + 17 + 19) chapters of 216 lines each, and 8 (3 + 5) words in each line. The movement from number to number and from form to form in

space – moving point produces the line, moving line produces the surface, moving surface produces the solid – and in writing is what produces the real and literary solid, based on a sequence and process that reminds us of OuLiPo's experimental use of constraints in literature, which will be analysed further in the next chapters.

Horizontal and vertical affinities in Barbaro

Number	Form	Cubes	^{3}Values	Sum values	Literary	Reciprocals
1	Point	1^3	1	1	Word	1/1
↔	↔	↔	↔	↔	↔	
↓	↓	↓	↓	↓	↓	
2	Line	2^3	8	3 + 5	Line	1/2
↔	↔	↔	↔	↔	↔	
↓	↓	↓	↓	↓	↓	
3	Plane	3^3	27	7 + 9 + 11	Chapter	1/3
↔	↔	↔	↔	↔	↔	
↓	↓	↓	↓	↓	↓	
4	Solid	4^3	64	13 + 15+17+1	Treatise	1/4
↔	↔	↔	↔	↔	↔	

Figure 35 George Hersey, analysis of Barbaro's system for the ideal treatise. From *Pythagorean Palaces*, London, 1976.

Barbaro seems to believe that an ideal treatise on architecture should follow such an organisational pattern, although this is against Vitruvius' own claim that a treatise should consist of 3 books/cubes of 216 lines each. Barbaro, with his system, first acknowledges the possibility of a literature that shares the same principles as architecture within a tradition of spatial writing, and second a possibility that Vitruvius is dealing with text as a solid structure similar to a building or the body of the Roman Empire. Barbaro's reading of Vitruvius is full of perspective drawings which, in accordance with the technological advancements of his period, generate

perception, memory and imagination to open up the page of the book as a window to space, differentiating the reader from the object and creating a distance from the book. This insight into space is different from Vitruvius' one, which uses memory as a raw material similar to the page to create the space. Barbaro's rotating drawings in his version of the *Ten Books on Architecture* are fascinating when he describes the *Regola come si potevano girare I thatri di Curione* (Study on how the theatres of Curione could rotate).[135] Gaio Scribonio Curione (90–49 BC) was a friend of Cicero, famous for his rhetorical art and attributed with the invention of the first amphitheatre made of wood which had the ability to rotate and from two theatres become one amphitheatre, depending on the spectacle. In his drawing, the two theatres are standing with their backs towards each other. There is a small string attached to the page that allows the drawing to rotate in order to create one amphitheatre. (fig. 36)

The invention of printing made it easier to do such rotating drawings, and the invention of perspective to externalise the content of books with images. It seems that mechanisms similar to those that were implemented in the space of the book by Vitruvius and meant to operate within memory are being transferred onto the physical space of the book or the page with the help of new technological advancements. The experience of space Vitruvius aimed to create by writing *Ten Books on Architecture* could be illustrated now by drawing, and the advantage is that there is not a need for any special training, such as mnemonic techniques. Experiments of this kind will be studied also later in examples such as Mallarmé's fans or rotating poems (mirlitons).

[135] Marcus Vitruvius Pollio and Daniello Patriarch of Aquileia Barbaro, *I Dieci Libri Dell'architettura Di M. Vitruvio Tradutti Et Commentati Da Monsignor Barbaro Eletto Patriarca D'aquileggia. Con Due Tavole. L.P* (Vinegia, 1556).

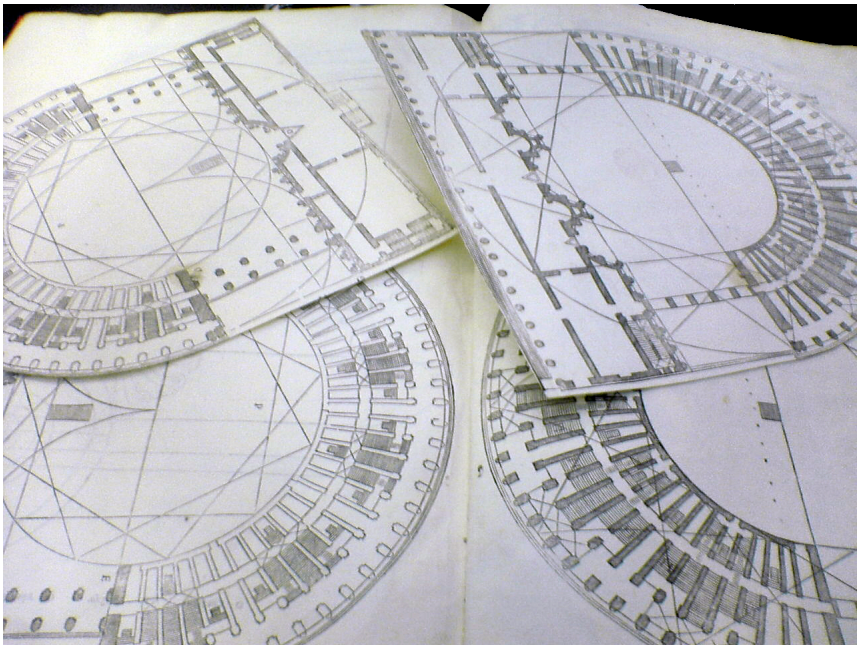


Figure 36 Daniele Barbaro, the rotating theatres of Curione. From Marcus Vitruvius Pollio and Daniello Patriarch of Aquileia Barbaro, *I Dieci Libri Dell'architettura*, Vinegia, 1556.

In conclusion, I would like to note that all of those interpretations, such as Cesariano's or Barbaro's, occurred much later, in the Renaissance. It seems that the secret of 'cubic poetry' is very well kept. Vitruvius' text itself has been through numerous re-writings and translations, so it is difficult to examine the original text for possibilities of writing incorporating Pythagorean cubic techniques. McEwen's spatial analysis is very important as well as her account of the arrangement of the ten scrolls on a single body based on Pythagorean theory. Such a spatial, orderly arrangement of the books based on the tetraktys, relating to the linguistic theory and philosophy of the period, seems to provide us with a new way of looking at the book and to unfold, as the scrolls unfold, different ways of reading or looking at the book(s). My own view is that with the specific extract of 'cubic poetry' Vitruvius suggests a methodology of writing on architecture that moves between styles and reflects two different (or not) ways of writing or reading, the Pythagorean and the Orphic, and two ways of remembering the book, by *natural* and *artificial* memory.

It is possible that the whole temple was inscribed in such a grid, or 'placed' in such a mathematical abstract space, not only for economy and the prefabrication of its various parts, but also as a mnemonic aid for the designer, builder or architect. Design was much different in antiquity than it is now: there was a shortage of paper, and the designer-architect-builder had to draw the images within his imagination. The algorithms or grids with which the building was described in its totality were a mnemonic device in the way mentioned above, like a wax tablet in someone's memory. With such a device, the architect could draw, experience and recollect the building through memory; memory was possibly the drafting paper of the architect, as it used to be the drafting paper of the orator. The whole building could be constructed by memory and also stored within memory in an abstract Pythagorean space – a space like the one in which Plato places his Ideas or Ideal solids. These images also had the ability to bring ornaments and mythical space into surface feelings and emotions, as the poetry of Orpheus does. Possibly all arts were more related in ancient Greece and Rome than they are now, and writing, drawing, mathematics and poetry were operating in a similar way: poetry had an element of design and mathematics, and architecture an element of the poetic images created by the text. To this could also be related the fact that reading and writing shared the same alphabet. Otherwise, calculating and writing or mathematics and poetry shared the same symbols with all their implications.

These mental lines, or grid, with which the temple is inscribed are a similar mnemonic device to connect elements of the building to 'divisions' of memory. In the Renaissance, as we will witness, these lines were called *linee occùlte*, or lines of Ideas – the same lines that in perspective drawings (although hidden) break up the surface of the page and open up memory to the experience (on the page) of space.

Symmetry such as the palindromic kind is a sort of a device that has the ability to keep together the space that is opened up in someone's memory – we are going to consider examples about this function of palindromic symmetry up until Mallarmé. Symmetry helps the mind not only to retain images but also to construct new ones, and it is similar in all arts such as architecture, poetry, sculpture and painting. Apart from the ability it has to construct objects and create forms, symmetry also has the ability to hold onto the ideas they represent – abstract ideas like the Pythagorean or Platonic, or poetic ideas like those of Orpheus. Symmetry within the text has exactly the same effect as it has within architecture or painting.

Words and letters in the palindrome were considered to be like solids, and this is why they were used in poetry and architecture to represent solidity, stability, or to define harmonic regions in fountains and domes. Such examples, as in the case of Vitruvius' temple and book(s), help to understand why and examine the context under which ideas about text and space developed. But also later in concrete poetry, anagrams and palindromes were applied for their ability to demonstrate language's strong visual and solid (concrete) character, having a similar but more abstract use than in antiquity.

In the next drawing (fig. 37), from Cesariano's commentary on Vitruvius' *Ten Books on Architecture*,[136] a *harmonic region* (*harmoniae regio*) is being defined as the space created by the palindromic arrangement and distribution of elements or letters. The letters of the alphabet are being represented as solids or cubes, which construct a space of harmony. Different alphabets come to indicate different *regions*, such as Chromatos (Colour) or Diatonic (Sound). It is the space created by the

[136] Marcus Vitruvius Pollio et al., *Di Lucio Vitruuio Pollione De Architectura Libri Dece Traducti De Latino in Vulgare Affigurati: Comentati (Da Caesare Caesariano), Etc. [the Editors Named in the Colophon as Augustino Gallo and Alvisio Da Pirovano.]* (Como: Gotardo da Pote, 1521).

rhythm[137] of the argument as well as by the expression of words with paper, marble or memory. The geometric relation, rhythm or analogy between the elements is the force that keeps together this *region* as well as what creates an experience of a vaulted form as a palindromic space.

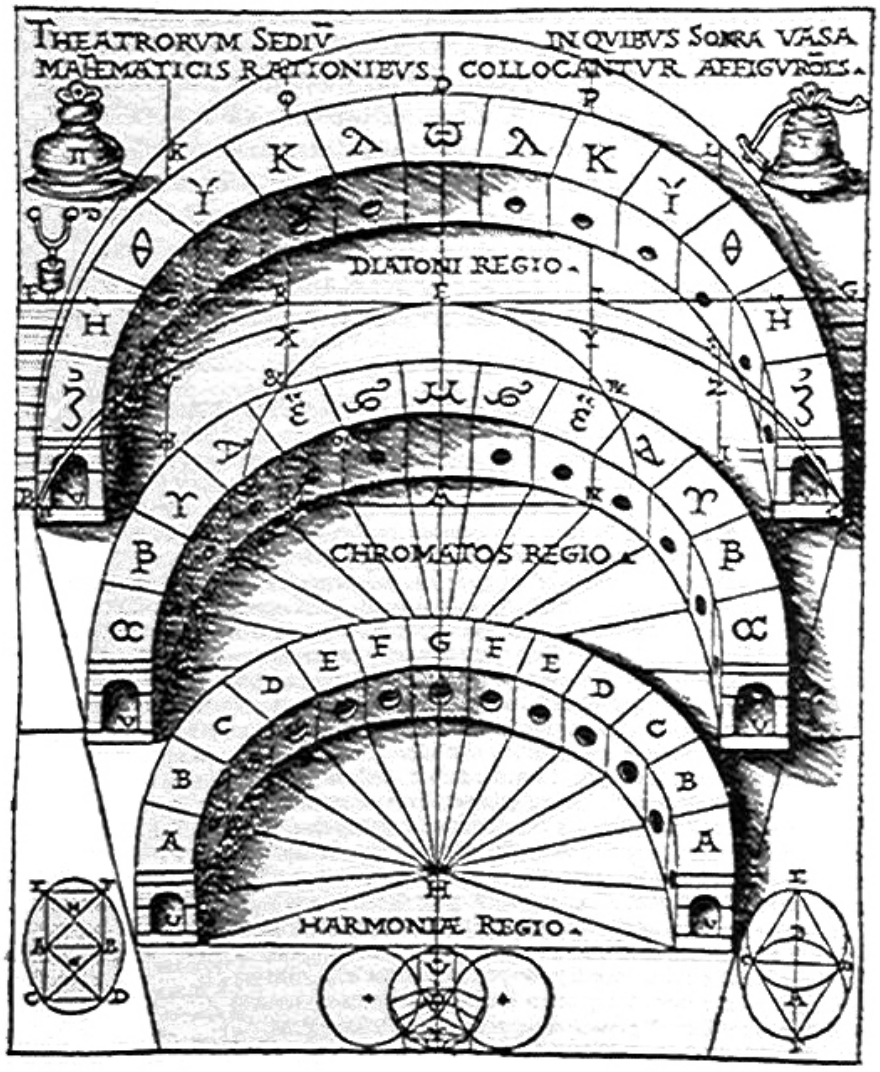


Figure 37 Cesare Cesariano, palindromic arrangements defined as *regions* in the form of arches. From Marcus Vitruvius Pollio et al., *Di Lucio Vitruuio Pollione De Architectura Libri Dece Traducti De Latino in Vulgare Affigurati: Comentati (Da Caesare Caesariano),* Como, 1521.

[137] In Greek, the word 'rhythm' stands for 'style' in architecture.

Mnemonics

The Pythgoreans, Plato and Aristotle, and later Roman theoreticians like Cicero influenced medieval and Renaissance thought, and the connection they created between language, geometry, images and space found practical applications in the system of mnemonics; these were techniques that aimed to facilitate memory (in eras where access to knowledge was difficult) and they were essential for the art of medieval rhetoric and the structure of arguments. In general, mnemonics were based on a geometric arrangement of memory where the words of the book could be stored and recollected at will, whenever it was necessary to form an argument or a speech from memory. These mental landscapes draw characteristics from buildings and cities, and there are examples where a whole book (architectural mnemonics) was geometrically and spatially translated into a city or a building;[138] for the medieval scholar, the action of walking inside this mental landscape was also the action of recollection and of the creation of an argument. In that case memory was experienced almost physically in a similar way to architecture. Frances Yates[139] was the first to write a short history of mnemonic techniques from ancient Greece to the Renaissance and identifies among them architectural mnemonics. One such example is Camillo's *Memory Theatre* (1550), which has influenced the evolution of theatre typology. Mary Carruthers's works[140] further consider the impact of books and emblems and their role in the organisation of memory. Images functioned textually, as a kind of

[138] According to Carruthers: 'Almost every monastic mnemotechnical scheme – ladders, roses, buildings, maps – was based on geometrical figures: squares, rectangles, circles and complex reformations of these, including three-dimensional structures (like the Ark described by Hugh of St. Victor begins with instructions of how to draw a rectangle mentally and then to trisect it …)'. Mary Carruthers, *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400–1200* (Cambridge: Cambridge University Press, 1998), p. 16.
[139] Frances Amelia Yates, *The Art of Memory* (London: Pimlico, 2003).
[140] Carruthers, *The Craft of Thought*; Mary Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture* (Cambridge: Cambridge University Press, 1992).

writing, and text could be translated visually with the intention of the internalisation of knowledge and its experience within memory. In the following passage Carruthers describes the work of some mnemonists and how important the geometry of language was to the geometry of memory. The text's geometry is directly linked to thought and the art of rhetoric:

> Boncompagno da Signa (c. 1170–after 1240) also discusses **manipulating a square for memory purposes**. These figures were to be manipulated mentally in order to make new connections among subject matters; Though the instructions for using them are often difficult, … they clearly were intended to provide **a machine of invention, both an architecture and an engineering of memory that required some knowledge of basic geometry to comprehend them**. Perhaps such mnemotechnical applications of geometry help to explain an otherwise obscure comment by Hugh of St. Victor, who defined one aspect of **geometry in the quadrivium as being 'fons sensuum et origo dictionis' (the source of [our] perceptions and the origin of [our] speech)**. Hugh, tellingly, has applied Cassiodorus's definition of the dialectical *topica* to geometry here, in an intellectual move that grounds our very comprehension and articulates our world in the 'geometry' of recollection. But the man who devised the mental game of planning Noah's Ark (selection 2) as an elaborate encyclopaedia of his learning – **diagram upon diagram, moving constantly in three and even four dimensions (for time is an aspect of it too)** – did indeed think geometrically, and in fact wrote an academic, or 'speculative', geometry text.[141] [emphasis added]

Carruthers's testimony of Boncompanio de Signa, who discusses *manipulating a square for memory purposes*, possibly echoes a Pythagorean influence which recalls Vitruvius' example where ancient Greek comic poets used to write poetry in a cubic form to facilitate memory while helping the mind to rest; for the mnemonists seem to depend on geometry for the creation of an argument. The orators/mnemonists needed some basic knowledge of design as they had to create a building or a whole city to store their books and arguments (fig. 38). Following the same theoretical principles of how text and image were related to knowledge and spatial experience, we can speculate that for architects, too, some knowledge of

[141] Mary Carruthers and Jan M. Ziolkowski, eds., *The Medieval Craft of Memory: An Anthology of Texts and Pictures*, *Material Texts* (Philadelphia, PA: University of Pennsylvania Press, 2002), p. 16.

rhetoric was necessary, as they had to know what kind of stories and arguments and how to implant them on their buildings. For example, there was a very hierarchical order of forms, subjects and themes, and where and how they should be placed in religious buildings – the main altar is always looking East, and the image of Jesus Christ is depicted in the main dome. In this way the building's spatial organisation operated as an argument, like a book, and movement and direction within the building's space was a process of visualisation and experience of the divine presence and knowledge.

It is no wonder that geometry becomes a source of both *perception and speech* and that a building operates both internally and externally; that is, it can be viewed with both internal and external vision, by the 'eye' or the 'eye of memory'.

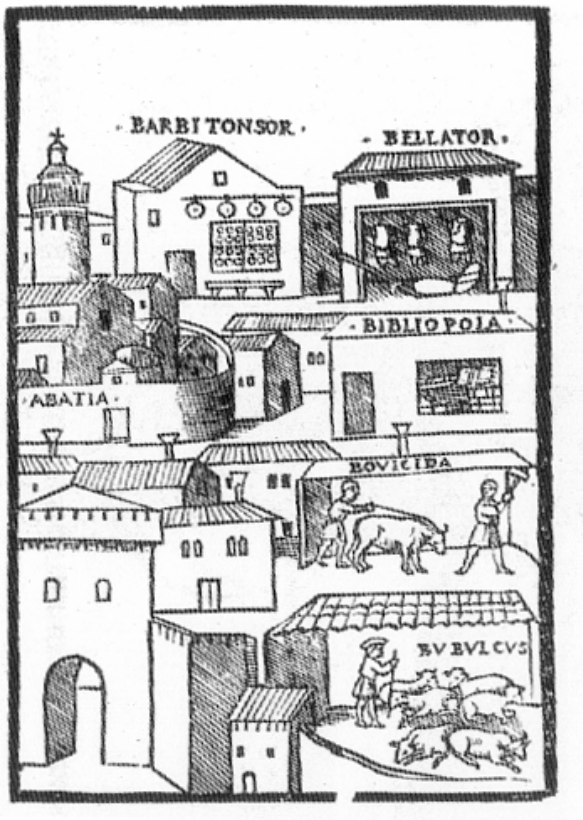


Figure 38 Johannes Romberch, abbey memory system based on the architectural mnemonics, 1533. From Frances Yates, *The Art of Memory*, London, 2003.

In ancient Rome and later in medieval times, the cities with their architecture were used as a map for memory, but also memory devices were implanted within the cities in order to generate images to the residents and the visitors that would help them remember events, dates or very simply just give directions, in periods when A–Z maps were not to hand. According to Marry Carruthers in her article 'Inventional Mnemonics and the Ornaments of Style: The Case of Etymology', columns in mnemonic devices were used to distribute topics of a speech;[142] for example, the fifth column of an imaginary building was also the fifth topic, or a symbol of an anchor on a column was a sign that it was a topic concerning naval subjects.

> We have, therefore, to imagine Cicero as he makes his speech, moving around some classical building, or some street in Rome, drawing from the memorised places, the images to remind him of this point. The method leaves the hands and the whole personality free for dramatic expression.[143]

Carruthers claims that such mnemonic devices were integrated within the city, which means that on columns you could find directions for how to get somewhere in a way you would not forget easily; we can imagine the flow and the circulations of the medieval city mnemonically integrated within the building in such a way that cities reflected themselves on their elements narcissisticly.

> In a study of the architectural orders – 'decorative elements' at their most evident – John Onians comments that by the time of the Empire, Romans 'expected to scan a building and look for features, especially in the columnar organization, which would articulate it'. Roman imperial cities bristled with columns, used in part to mark their owners' status and, in a communal context, to give addresses to the places of the city. These columns, literally and figuratively, 'invented' the city as a human community, a network of places by means of which a person could find her way.[144]

[142] Mary Carruthers, 'Inventional Mnemonics and the Ornaments of Style: The Case of Etymology', review of Reviewed Item, *Connotations*, no. 2 (1992), http://www.uni-tuebingen.de/uni/nec/carruthe22.htm.
[143] Ibid.
[144] Ibid.

From personal experience, I could easily imagine buildings playing such a role in a medieval city like Venice, a place with such a complex structure of streets, canals and piazzas that even now printed maps are of little use and instead the visitor has to create a mental map based on buildings, elements of buildings, or ornaments that are being used as mnemonic landmarks. Unfortunately, the art of memory is an 'invisible art'; it reflects real places but is not about the places themselves. Rather, it is about the reflection of places within the imagination, which means that these directions have been lost and the cities do not tell the same stories anymore.

But the mnemonic function of the city brings it even closer to its function as a book, and if a book could be translated into an urban landscape – with the practice of mnemonics – then it follows that the city itself could be experienced as an argument. For one trained in mnemonic systems, the function of reading and remembering a book was an embodied experience of a city or a building, but for such a person a walk within an actual real city or a building would make use of the same operations of the mind and the same language: operations that transformed the city into an argument, to a combination of arguments, or a book. A walk in a new city or a cathedral would have been also the creation of a new argument in combination with all the previous books read and experienced, and all the cities stored in the mind – not to mention that the task of designing a new building would have been a task similar to that of making a new argument, or a new book; a book imposed onto matter together with clues/directions for the way that it could be recollected. For an architect's memory trained to read and remember a book, a city and a building in the way described above, I believe it would have been difficult to design a building without using memory and imagination in a similar way, and according to Yates and Carruthers mnemonics was a very important part of the medieval student's education;

books and buildings (with paintings, sculptures and ornaments) seem to be much closer as objects than we think now.

According to Yates:

> a building lives, not only by its actual visible existence, but by its invisible reflection in the memories of generations of men.
> And this puts me in mind of the thought, that real buildings are the result of invisible plans in minds of architects. As Alberti says, the function of the architect is to produce the design of the building, and this is not material, but exists in the mind of the architect, and is based on abstract considerations of mathematics and proportion. The design of the building is prior to its execution in material stuff.
> So I leave you with the thought, that buildings may be less solid than they seem; existing invisibly down the ages in the memories of generations.[145]

The imagination of the mnemonist, occupied by all these images, buildings, objects, persons, events, books, must have been a various and colourful place to reside and explore; almost endless in combinations of elements, cities, buildings and arguments, which could be re-arranged over and over again in a creative process of new books, new cities, new buildings or just new memory places. Carruthers, observing how Bruno used this memory-technique, claims that 'Giordano Bruno was still using this technique in the sixteenth century; he speaks of adding Parisian places to Roman places, adding places memorised in Paris to places memorised in Rome'[146] – a process of imagination liberated from direction and linearity.

In a speech she gave at the Architectural Association, published in *AA Quarterly* (1980),[147] Yates refers to this kind of memory as 'artificial memory', and relates it to architecture, to the growth of computers and cybernetics. In our century, all existing knowledge is stored in a similar form of 'artificial memory', but outside

[145] Frances Amelia Yates, 'Architecture and the Art of Memory', *Architectural Association Quarterly* 12, no. 4 (1980): 12.
[146] Carruthers and Ziolkowski, eds., *The Medieval Craft of Memory: An Anthology of Texts and Pictures*, p. 5.
[147] Yates, 'Architecture and the Art of Memory'.

the mind, in computer hard drives and the internet. Yet in both cases there are strong similarities in the way that language, image and cityscapes are used.

Yates locates abstract ideas within this place of memory. When she describes the memory of St Augustine (354–430), philosopher and theologian, she claims:

> Augustine plunges into the recesses of his memory, seeking God; and his memory is not like ours. It is a vast classical memory of places and images, stored with all the contents of the universe, all the encyclopaedia of learning: a built-in memory; the artificial memory of the orator, combined with the Platonic philosopher's belief in memory as the reflection of the divine world.[148]

Augustine used the technique of mnemonics to experience God with his mind and created a city made of all his knowledge and experiences. In medieval culture mnemonics were used to remember the book as well as Hell or Paradise; 'for example the "Doom" porches of the medieval cathedrals and churches … are a transformation of the places and images of the classical art of memory … how to remember Hell'.[149]

With the invention of printing, the mind was moving towards liberation from the 'built-up memory' of the text, but the 'art of memory' didn't disappear. Instead there were printed treatises on the subject of 'artificial memory' and this practice was recorded in books. Cosmas Rossellius, Italian monk of the Franciscian order and creator of several one-handed manual alphabets, in his *Thesaurus Artificiosæ Memoriæ* (1579)[150] not only illustrates paradise as a map of a city but also gives directions as to how to remember/experience it through memory using image and text (fig. 39). Rosselius incorporates the map/city of paradise using reversed symmetry in the beginning and the end of his relative chapter. It is possibly to anchor text to memory – or memory to text – using mirrored symmetry and to bring together the

[148] Ibid., p. 5.
[149] Ibid., p. 7.
[150] Cosmas Rossellius, *Thesaurus Artificiosæ Memoriæ* (Venetii: Apud Antonium Paduanium, 1579).

pieces, elements of paradise that could be experienced mnemonically like the example of the double-headed eagle; a process related to the use of palindromes as spatial structures from poetry to the book, to architecture (in examples from Alberti to Mallarmé).

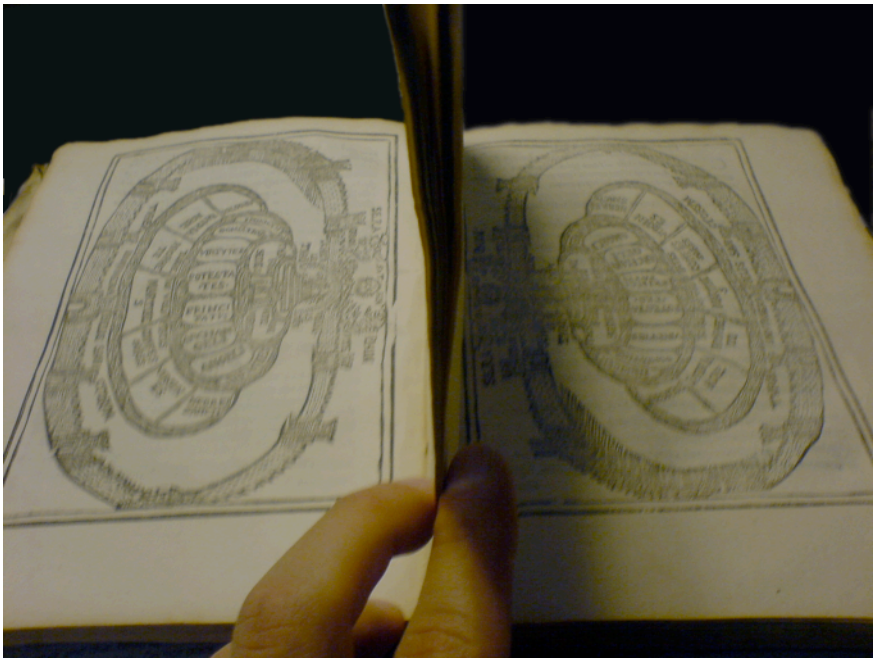


Figure 39 Cosmas Rossellius, paradise as a mnemonic device incorporated – using mirrored symmetry – within the book. From *Thesaurus Artificiosæ Memoriæ,* 1579.

Distinction between Perspective Representation and Mnemonics

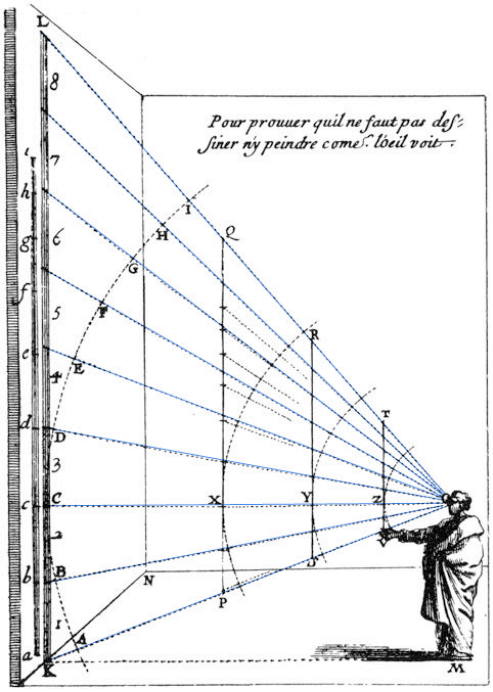


Figure 40 A. Bosse, *Traité des pratiques geometrales et perspectives,* 1665.

Figure 41 R. Fludd, *Utriusque Cosmi ... Historia, Tomus Secundus, Oppenheim*, 1619.

The above images are taken from two books, (fig. 40,41) both published in the seventeenth century: one of them dedicated to the art of perspectives and the other to the 'art of memory'. The first illustration is from Abraham Bosse's (c.1602–1676) *Illustration from Traité des pratiques géometrales et perspectives* (1665), and the second from Robert Fludd's (1574–1673) *Utriusque Cosmi ... Historia, Tomus Secundus, Oppenheim* (1619). Within both of these pictures are drawn the invisible lines that relate two worlds: the world of external reality to that of the mind, memory and imagination. It is fascinating that these illustrations not only demonstrate the distinction between two approaches – perspective and mnemonic representation which relates also to the Orphic and Pythagorean tradition – but also reveal how similar or complementary they are. The human stands in between image and memory,

and from the eye are drawn the invisible lines that build up the structures which guide from the outside to the inside, or the opposite; a forwards and backwards movement, like the one presented and analysed in the palindrome.

Memory was the place where God was located or sought, and as we are going to examine later is the place where Mallarmé used to locate the Void, the distance between objects and thoughts in *Un Coup de Dés*, or the place/building that Perec populated with people and stories in his *Life A User's Manual*.

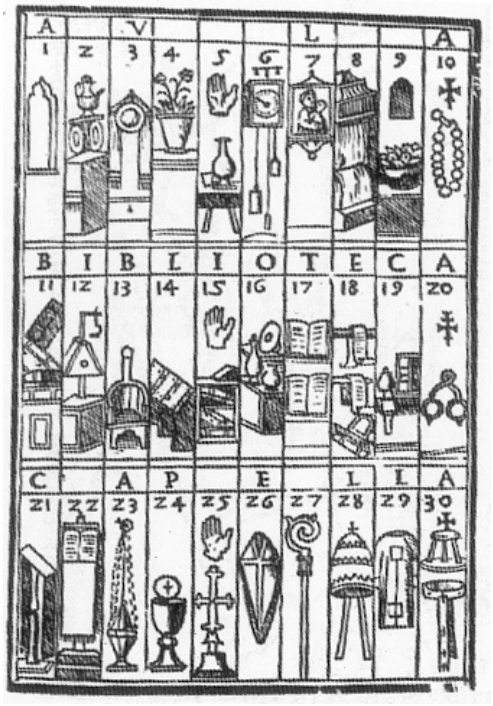


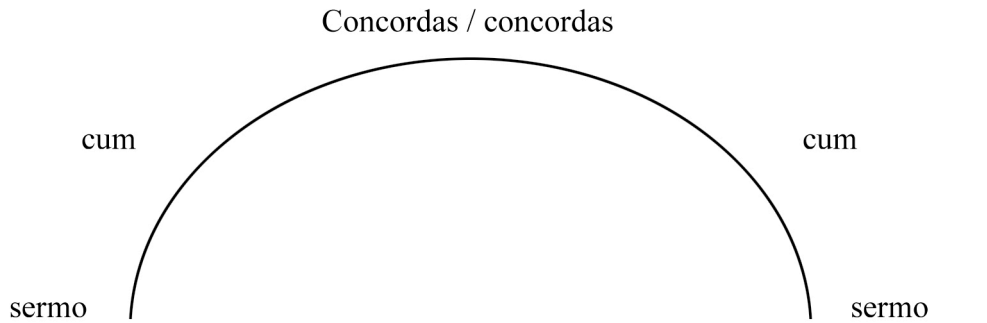
Figure 42 Johannes Romberch, images to be used in the Abbey memory system (fig. 38), 1533. From Frances Yates, *The Art of Memory*, London, 2003.

Domes and Arches as Palindromes

The structure of the argument in medieval and Renaissance rhetoric was related to the geometric structure of text and that of memory. Roy Eriksen, Professor of Italian Renaissance Studies and English literature, in *The Building in the Text*, gives an example of how this kind of textual structure relates to architectural writing and transfers these ideas to the space of architecture; he relates the architecture of reasoning (analysed by Mary Carruthers) to architectural writings and to the building itself.[151] Eriksen's examples are significant because he relates cyclical and triangular architectural forms directly to symmetrical palindromic poetic structures. Equally important is his structural/geometrical analysis of the symmetries in Alberti's writings, which he compares to Michelangelo's Dome of Santa Maria Dei Fiori in Florence. In his introduction Eriksen claims that Renaissance poets used frequently formal poetic structures to shape their compositions; words were repeated to indicate the beginning, middle and end of a composition in analogy to vaulted and triangular architectural forms. According to Eriksen:

> Take, for example, a sentence in Augustine's 'Ernarratio in Psalmum CXXIX,' where the father of the Christian rhetoric argues that the man should be in accord with the word of God:
>
> > Est enim Dei adversaries tuus, quambiu *cum* illo non *concordas*. *Concordas* autem, *cum* coeperit te delectare facere quod dicit *sermo*. [For *the Word of God* is thine adversary, as long as *thou dost not agree* with it. *But thou agreest,* when it has begun to by thy delight to do what *God's Word* commandeth.] [emphasis added]
>
> Augustine articulates in the sentence's antithetical structure the very idea of unity with the Word of God by qualifying the initial statement with the phrase '[b]ut thou agreest' and by balancing his own words: *sermo…cum…concordas / concordas…cum…sermo.* His sentence structure thus makes the meaning visible in the page, as it were. If we imagine that these repetitions occupy positions on a curve, that curve could be said to be formally analogous to the section of 'a vaulted dome', to borrow Demetrius phrase, or it may be seen as a triangle or a pyramid (see diagram).

[151] Roy Eriksen, *The Building in the Text: Alberti to Shakespeare and Milton* (Pennsylvania State University Press, 2001).



[152]

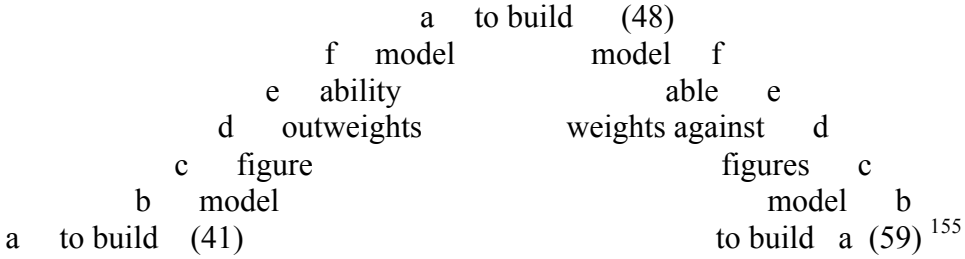
In the above example we can observe that the poem is structured around the repetition or the periodical arrangement of three words (Sermo-Cum-Concordas). This structure operates both visually, mentally and temporally. There is an obvious mirrored symmetry at the above poetry's arrangement, which forms a word palindrome of the key words (Sermo-Cum-Concordas-Cum-Sermo) and results to the creation of a structure similar to that of a 'dome' or a form similar to a 'triangle' or a 'pyramid.' In other palindromes we have an even denser periodic arrangement of their elements, which creates an even denser (semi)circular form. Eriksen continues that '… The members in a periodic style may, in fact be compared to the stones which support and hold together a vaulted dome',[153] so the periodic, symmetrical arrangement of the palindrome offers a very dense scaffold, upon which words are built like an edifice.

Eriksen, writing about literature's relation to architecture, claimed that a well organized text or poem had a structure similar to that of a building. Mirrored symmetry was considered to be an ideal system for the transition from the mind of the poet to the material world of the book and this had to be illustrated in writing. But if this works for writing can't we claim that it is the same for the procedure of design and for the building itself? That argument becomes even stronger as Eriksen suggests

[152] Ibid. p.xiv
[153] Ibid. p.xiiv

that "plot" is used to "denote" not only a "literary structure but also a small piece of ground or a ground plan, as for a building; chart; diagram."[154] In the following example taken from a speech in Shakespeare's Henry IV, the dramatist compares the plotting of high treason to the construction of a building, the mental planning to the planning of a house. It is also very interesting to examine how this argument is structured:

> [Shakespeare's] emphasis on what one of his contemporaries had referred to as a 'figure, and symmetry mentall' and the 'immaterialitie of perfect Achitecture' emerges clearly in the 'model' formed by the following underscored repetitions:
>
> 41 When we mean *to build*,
> We first survey the plot, then *draw the model*,
> And when we see the *figure* of the house,
> Then must we rate the cost of the erection,
> 45 Which if we find *outweighs ability*,
> What do we then, but draw anew *the model*,
> In fewer offices, or at least desist
> *To build at all*? Much more, in this great work
> (Which is almost to pluck a kingdom down
> 50 And set another up) should we survey
> The plot of situation and *the model*,
> Consent upon a sure foundation,
> Question surveyors, know our own estate,
> How *able* such a work to undergo,
> 55 *To weight against* his opposite; or else
> We fortify in paper and in *figures*,
> Using the names of men instead of men:
> Like one that *draws the model* of an house
> 59 Beyond his power to *build it*;…
>
> The system behind these tangible repetitions appears clearly if we extract the repeated words from the flow of blank verse (see diagram).

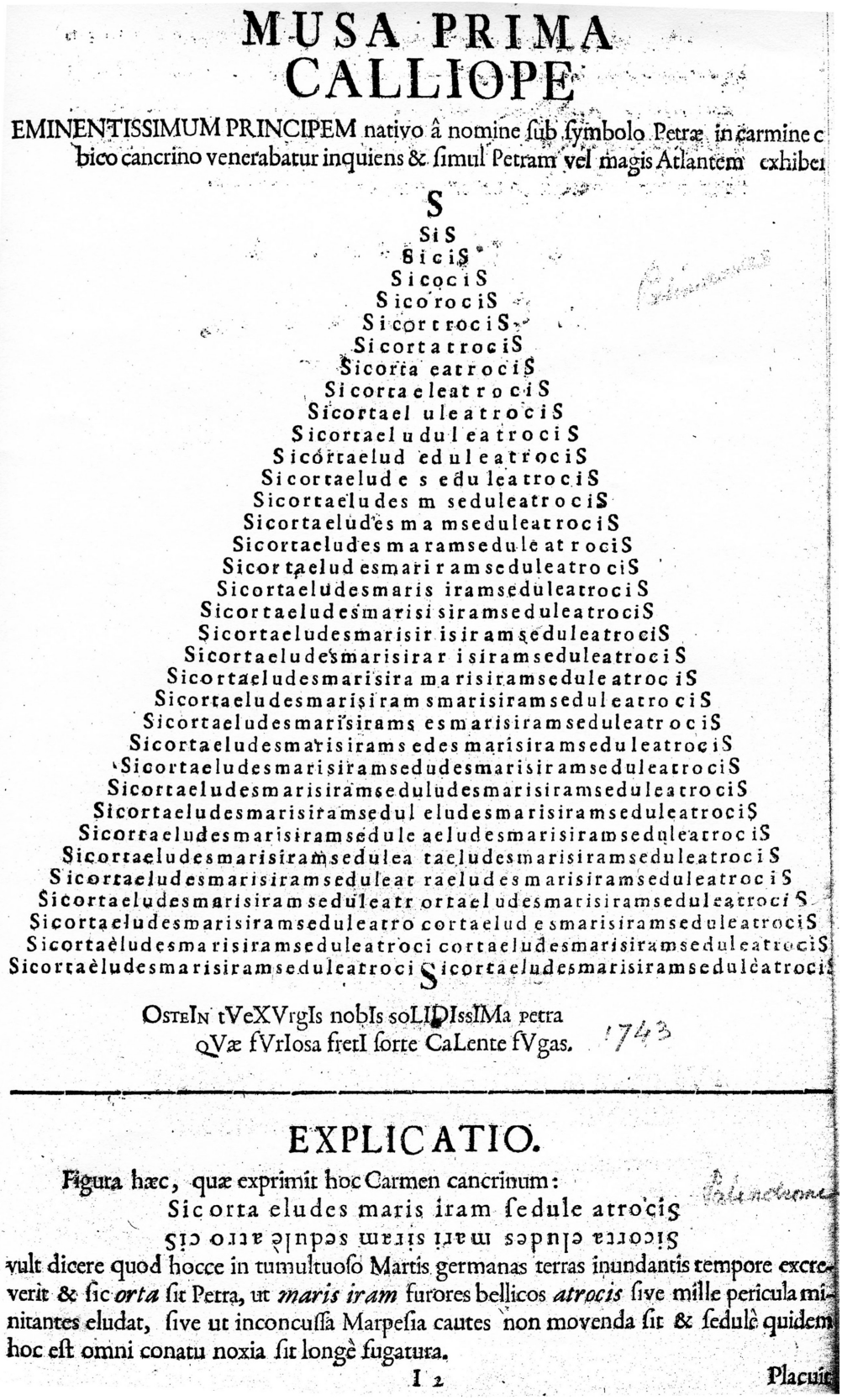


[154] Ibid. p. 2
[155] Ibid. pp. 7-8

Shakespeare in the above extract not only talks about the formal relations between poetry and architecture but also provides an example of how these could be treated. In Eriksen's analysis, the poet constructs the following structure: a, b, c, d, e, f, a, f, e, d, c, b, a. All the words around which the text is structured are mirrored and the words 'to build' are used as a centre of balance.[156] In the form of a palindromic sequence hidden inside the structure of the text, the poet aims to create a dense structure similar to that of the *dome* and also to describe the procedure of building a literary or architectural edifice. Eriksen does not mention the word palindrome – he refers to 'mirror symmetry', 'antithetical patterns', 'triangular', 'oposita' – but palindromic values are recognisable not only in the mirrored symmetry of the words but also in their self-referential nature.[157] According to Augarde's description, palindromes used to have a much wider definition in Antiquity and in the Renaissance, including word palindromes and examples as the one above from Eriksen.[158]

There are numerous examples of palindromes arranged in circles and pyramids reinforcing the palindrome's relation to triangular forms and architectural features like the dome. One such example comes from an eighteenth-century collection of visual poetry:

[156] The verb 'to build' is made to mark the beginning, middle and end of the verbal web. Ibid., p. 9.
[157] '[T]he principle of composing by rhetorical *opposita* or *antitheta* is echoed in the emphasis on the need to weigh everything "against his opposite", thus making the phrase self-referential.' Ibid., p. 8.
[158] According to the description of Tony Augarde, *The Oxford Guide to Word Games*, 2nd ed. (Oxford, New York: Oxford University Press, 2003).



MUSA PRIMA CALLIOPE

EMINENTISSIMUM PRINCIPEM nativo â nomine ſub ſymbolo Petræ in carmine c
bico cancrino venerabatur inquiens & ſimul Petram vel magis Atlantem exhibe

S
SiS
SiciS
SicociS
SicorociS
SicortrociS
SicortatrociS
SicortaeatrociS
SicortaeleatrociS
SicortaeluleatrociS
SicortaeludueatrociS
SicortaeludeduleatrociS
SicortaeludesedueatrociS
SicortaeludesmseduleatrociS
SicortaeludesmamseduleatrociS
SicortaeludesmaramseduleatrociS
SicortaeludesmariramseduleatrociS
SicortaeludesmarisiramseduleatrociS
SicortaeludesmarisisiramseduleatrociS
SicortaeludesmarisirisiramseduleatrociS
SicortaeludesmarisirarisiramseduleatrociS
SicortaeludesmarisiramarisiramseduleatrociS
SicortaeludesmarisiramsmarisiramseduleatrociS
SicortaeludesmarisiramsesmarisiramseduleatrociS
SicortaeludesmarisiramsedesmarisiramseduleatrociS
SicortaeludesmarisiramsedudesmarisiramseduleatrociS
SicortaeludesmarisiramseduludesmarisiramseduleatrociS
SicortaeludesmarisiramsedulesmarisiramseduleatrociS
SicortaeludesmarisiramsedulaeludesmarisiramseduleatrociS
SicortaeludesmarisiramsedulaetaeludesmarisiramseduleatrociS
SicortaeludesmarisiramseduleatraeludesmarisiramseduleatrociS
SicortaeludesmarisiramseduleatrortaeludesmarisiramseduleatrociS
SicortaeludesmarisiramseduleatrocortaeludesmarisiramseduleatrociS
SicortaeludesmarisiramseduleatrocicortaeludesmarisiramseduleatrociS
SicortaeludesmarisiramseduleatrociSicortaeludesmarisiramseduleatrociS

OsteIn tVeXVrgIs nobIs soLIDIssIMa petra
qVæ fVrIosa freII sorte CaLente fVgas. 1743

EXPLICATIO.

Figura hæc, quæ exprimit hoc Carmen cancrinum:

Sic orta eludes maris iram ſedule atrocis

Sicorta eludes mari siram sedule atrocis

vult dicere quod hocce in tumultuoſo Martis germanas terras inundantis tempore excreverit & ſic *orta* ſit Petra, ut *maris iram* furores bellicos *atrocis* ſive mille pericula minitantes eludat, ſive ut inconcuſſa Marpeſia cautes non movenda ſit & ſedulò quidem hoc eſt omni conatu noxia ſit longè fugatura.

I 2 Placuit

Figure 43 This eighteenth-century example shows a palindrome in a triangular shape. From *Coelum orbis Teutonici,* 1746.

The same 'antithetical' patterns have been also used by Alberti in his writings to create 'a textual web whose overall form reflects the lineamenta of the dome itself. In other words, the witty verbal design emulates the splendor of the dome so that the verbal patterning becomes a significant part of the description – a verbal sign pointing to the architectural design.'[159]

We find a parallel study to Eriksen's on the hidden geometries of literature in Arielle Saiber's *Giordano Bruno and the Geometry of Language*, where she analyses the spatiality of Bruno's writing in relation to his philosophy.[160] In her book she argues that symmetrically structured literary patterns are not linear but angular: 'If the lines are coming from precisely opposite directions, the angle at which they meet will be zero degrees (or 180).'[161] Thus symmetrical reflections like those of palindromes are not linear, but angular, and 'two lines meeting on a plane do not become one and the same line, but an angle, a joining of discrete rectors'.[162] Saiber names those structures *chiastic.*[163] Bruno used such structures often in his literature, and Saiber's analysis is helpful because she gives evidence of how to analyse literature spatially. Describing an emblem in one of Bruno's books (this emblem has been looked at in detail in the *Definition of the Palindrome, Cancellation of Meaning,* pp. 29-34), she says that under the words 'Hostis non hostis' is shown 'a fly attracted to a flame – the very thing that kills it, should it get too close', which signifies that 'fragmentation, however, harbours within it a potential of unification', an interpretation that recalls the palindromes of the double-headed eagle analysed in the introduction. The emblem

[159] Eriksen, *The Building in the Text: Alberti to Shakespeare and Milton*.
[160] Arielle Saiber, *Giordano Bruno and the Geometry of Language* (Aldershot, Burlington: Ashgate Publishing, 2005).
[161] Ibid., p. 91.
[162] Ibid., p. 93.
[163] 'Norman defines chiastic-structure however in the standard way, as AB-BA or ABC-CBA, and calls it literally symmetrical.' In other words, palindromes consist of such kinds of chiastic structures or angular rhetoric. Their space is that of an angle on a plane and not linear. Arielle Saiber. Ibid., p. 96.

described above is an example of a chiastic structure, but also is a word palindrome and its meaning reminds us of the Latin palindrome that describes the actions of the moths (we enter the circle after dark and we are consumed by fire). Apart from the chiastic structure, Saiber also analyses other structures in Bruno's literature like those of 'epanodos and traductio', which 'repeat a motif (a word, a phrase, an idea) as if through a mirror, or as a row of tiles on a floor. While both symmetries may seem linear on the surface, implicit within them are concepts of the angle, coincident meaning, and triadic structures.'[164]

Anagrams, acrostics and palindromes in combination with other techniques (like the grids, over-layering, etc.) were used extensively in mnemonics because they had the ability to provide geometrical patterns for the storage and the mental experience of knowledge. Relating mnemonics to Eriksen's and Saiber's textual analysis, the role of the palindrome is possibly to create a text with such a solid triangular structure (like a vault or a dome) that it can create a spatial topology of memory that can be experienced like a building's vault or dome, providing at the same time the freedom of movement (forwards/backwards) in space and time of the text's recollection. These examples teach us that the palindrome's temporal movement is not hierarchical; the temporal qualities of the text or the narrative come through form, not through sequential occurrences of incidents or a linear narrative – what follows is not a coincidence of what happened first. You cannot distinguish events and when they happened. All of them belong to the past (or remain for future use) and function like locations. It is up to individual memory to link them and create a discourse, like walking in a city or being under a dome and looking at its elements.

[164] Ibid., p. 102.

Hersey, in *Pythagorean Palaces*,[165] creates a direct link between Alberti's architectural writings, his architecture and palindromes, which can be related also to Eriksen's investigation of palindromic sequences in Alberti's writings. Hersey describes Alberti's law of cubism. According to him Alberti, influenced by the Pythagoreans and Vitruvius, believed that 'all good proportions spring from the First of Cubes. From its immediate products, 2, 2^2, and 2^3, and from 12 (which he erroneously says is the square of the cube's diagonal), the architect builds his sequence of ratios, distributions and dimensions.'[166] For all different numeric qualities that didn't follow this pattern, Alberti developed a law that he called the principle of dyity. According to this principle:

> a 'mobile' number can be reduced to cubic form by isolating a central, cubic factor or factors and flanking this with two equal cubic remainders … To give an example of this sort of factoring, 9 can be written 4 1 4, or 3 3 3, or 2 2 1 2 2. And an even number, 8, can be seen as mobile when written 4 0 4 or 2 2 0 2 2. The only necessity is that there must be an axis, usually 1 or 0, and that the whole sequence must form a **numerical palindrome**. This arrangement is what Servius, for example, has in mind when he says that 3 has a beginning, middle and end. A proper building is pervaded by these Pythagorean dualitites in all directions, and they must always be constructed, Alberti adds, along straight lines and at right angles.[167] [emphasis added]

This shows us not only that symmetry was very important for the design of a building but also that all non-perfect numbers should follow the law of palindromic reduction:

> Thus, for example, a 17-foot-long wall presumably noncubic in dimension, can move to a cubic state by being articulated (for example with pilasters) into zones of 4 3 3 3 4. These numbers, and their sums and products, are all direct offspring of the First of Cubes. On the other hand, if the 17-foot dimension, when subdivided, becomes 5 7 5, or even 3 11 3, it has not been cubically reduced.

[165] Hersey, *Pythagorean Palaces*.
[166] Ibid., p. 28.
[167] Ibid., p. 29.

Here palindromes are treated as writing machines, having the ability to analyse the structure of a form. The same values introduced in Alberti's writings are also found in his principles of architectural design and spatial theory.

What these critical analyses all support is the idea that palindromes introduce spatial values to literature and literary values to space. The book in this case stands in the middle, between materiality and memory or between architecture and memory. On the one hand material space or architectural features and elements are used to remember and recollect the book: and on the other, architecture borrows literary patterns and structures in order to be perceived, remembered or designed or to form consciousness, like a book. The relation between the building, the book and memory was evident in Gothic and Renaissance architecture. The description of the Gothic church by Victor Hugo[168] as a book aimed to visually educate people is very well known.

[168] The specific example is of Notre Dame in Paris in *Les Misérables*, where its decorative elements and sculptures were playing the role of a book to instruct people. Victor Hugo, *Les Misérables* (Paris: Ernest Flammarion, 1862).

Giulio Camillo's Memory Theatre

As an example of how mnemonics could relate to an edifice and a book within a tradition of spatial writing, we will examine Giulio Camillo's (1480–1544) *Memory Theatre*. For Camillo, this theatre was a life project and an attempt to design a space where he was going to include all existing knowledge of the world, operating as a miniature of the universe itself. By experiencing the space of the theatre, the viewer would also be able to experience, learn and at the same time (re)create the images and arrangement necessary for the recollection of this knowledge. Whoever entered this theatre was able to create an argument in a similar way, as described before by Cicero who needed the repository of signifiers that was the city of Rome for his rhetoric endeavours.

According to Yates, a wooden model of the Memory Theatre was built first in Venice and then at the court of the king of France, Francis I (1494–1547). There is nothing left of the theatre itself, just as there are no images or drawings to help recreate its form, structure and mechanisms. This is possibly because Camillo's writings were considered to be heretical. Yates provides various accounts of the structure, for instance Viglius Zuichemus' detailed but sceptical description in a letter to Erasmus (1466/69–1536), when he saw the model in Venice in 1532. According to Viglius, quoted by Yates:

> They say that this man [Camillo] has constructed a certain amphitheatre, a work of wonderful skill, into which **whoever is admitted as spectator will be able to discourse on any subject no less fluently than Cicero** … He pretends that all things that the human mind can conceive and which we cannot see with the corporeal eye, after being collected together by diligent meditation may be expressed by certain **corporeal signs** in such a way that the beholder may at once perceive with his eyes everything that is otherwise hidden in the depths of the human mind. And it is because of this corporeal looking that he calls it a theatre. [emphasis added][169]

[169] Yates, *The Art of Memory*, p. 135.

The above is possibly the most direct reference to the actual Memory Theatre and it seems that Camillo attempted to externalise mnemonic processes. In this case, corporeal signs have the ability to express the *incorporeal* that is perceived by the mind. For his attempt, Camillo is using Roman *sign* and *mnemonic theory* as it was developed by Cicero. In the Renaissance there was a more general tendency towards the externalisation of mental processes, which is also demonstrated by the invention and development of perspective. As a method, perspective aimed to (re)create a real-life representation of the outside world based on how it is perceived: possibly Camillo's attempt was to do something similar with mental processes.

Camillo's deal with Francis I was that, in exchange for funding, he would never reveal the details of his project to others; when Camillo moved back to Italy, however, just before his death in 1544, he recounted his project to his close friend Girolano Muzio, who wrote everything down and finally published his notes in 1550, in Venice. The book, entitled *L'Idea del Teatro*,[170] describes Camillo's vision of the mnemonic theatre in great detail. Yates's interpretation and drawing is based upon this description. According to Yates and *L'Idea del Teatro*, Camillo's Memory Theatre was a wooden construction, large enough to accommodate one or two people, and not only was narrated in seven days but also was founded on the seven pillars of Solomon (fig. 44). The whole structure develops in seven zones/grades. It is described as being a grid-like, geometrical or scientific arrangement that represent the world, upon which are placed mythical narratives in the form of images and drawers containing text. The first zone is dedicated to the Planets: Diana, Mercury, Venus, Mars, Jupiter and Saturn; the second to the Banquet (there is an exchange in the

[170] Giulio ca Camillo, *L'Idea Del Teatro E Altri Scritti Di Retorica*, *Alethes; N. 1* (Torino: RES, 1990).

middle of the first and second zones between the Banquet and the god Apollo); the third zone to the Cave; the fourth to the Gorgons; the fifth to Pasiphae; the sixth to the Sandals of Mercury; and the seventh to Prometheus. Each zone contains myths and allegorical descriptions of emblematic images, with decorated gates that lead to them, and drawers filled with texts. Yates gives a very detailed analysis of the whole structure and its contents and images, as well as the theatre's influence on the development of the *art of memory*, and relates Camillo's theory and writings to other medieval and Rennaissance philosophers such as Ramon Llull (1232–1315), Dante Alighieri (1265–1321), Marsilio Ficino (1433–99), Erasmus, Giovanni Pico della Mirandola (1463–94) and Giordano Bruno (1548–1600).

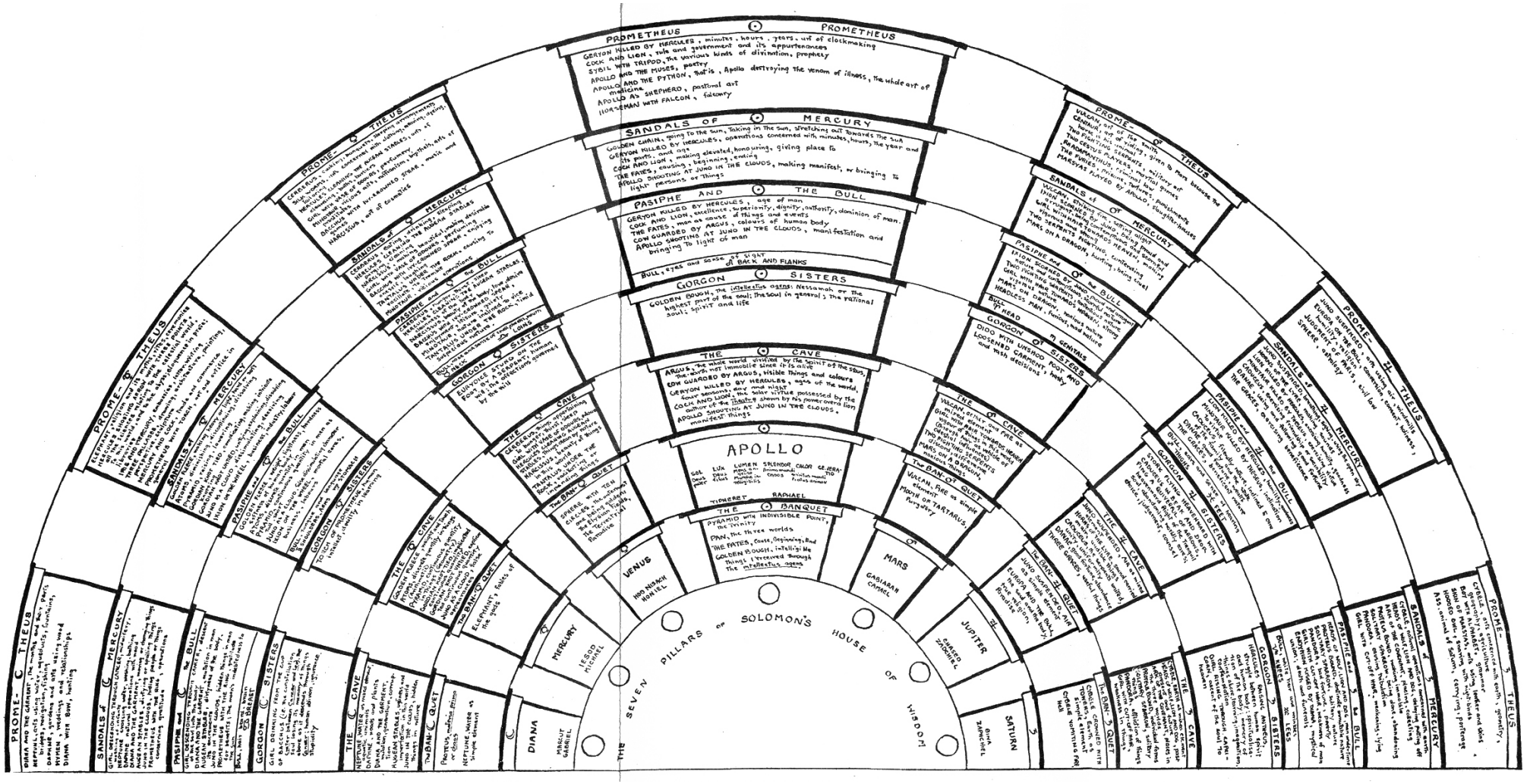


Figure 44 Frances Yates, interpretation of Camillo's memory theatre. From *The Art of Memory*, London, 2003.

To draw the diagram of Memory Theatre, Yates follows the hierarchical arrangement of Vitruvian theatre[171] and relates it to the development of the theatres typology and in particular to the Globe Theatre. Vitruvius was very popular in Venice at that time because his writings had been rediscovered. For example, Vitruvius' description of the Roman theatre influenced Renaissance architects, such as Andrea Palladio (1508–80) when he designed *Teatro Olimpico* (1584) in Vicenza and possibly Camillo when he designed his Memory Theatre. Yates also argues that, with his structure, Camillo reverses the theatre's typical relation between audience and spectacle.[172] Camillo places the human in the middle of the universe or spectacle and from there the viewer can observe and experience the world, witness its phenomena and gain wisdom. This reversal process recalls Vitruvius' gesture to place the human image in the heart of his book and the heart of the Roman Empire, which was also the existing world at the time (analysed before).

In another more recent example artist Kate Robinson, in *A Search for the Source of the Whirlpool of Artifice: The Cosmology of Giulio Camillo*, uses Yates's analysis as a starting point and proceeds with a detailed reading of Camillo's book, its history and its relations to personalities like Bruno and books like Francesco Colonna's *Hypnerotamchia Poliphili* (1499)[173] associated with Camillo before suggesting her artistic interpretation (fig. 45). According to Robinson, 'scattered throughout *L'Idea del Teatro* are references to the body, explaining Camillo's theory that the "inner" and the "outer" man correspond to each other through a system of

[171] 'This was the Vitruvian type of theatre which Camillo had in mind, but which he distorted by decorating with images, not the five doors of the stage, but his imaginary gates in the seven gang-ways of the auditorium.' Yates, *The Art of Memory*, p. 173.
[172] 'For in Camillo's Theatre the normal function of the theatre is reversed. There is no audience sitting in the seats watching a play on the stage. The "solitary" spectator of the Theatre stands where the stage would be and looks towards the auditorium, gazing at the images on the seven times, seven gates on the seven rising grades … Camillo never mentions the stage and I have therefore omitted it in the plan.' Ibid., p. 141.
[173] Francesco Colonna, *Hypnerotomachia Poliphili: The Strife of Love in a Dream*, trans. Joscelyn Godwin (London: Thames & Hudson, 2003).

vital equivalence'.[174] Also according to Robinson, following the medieval medical tradition Camillo relates planets with parts of the body, which by their turn correspond to parts of memory's theatre and parts of the book and its contents. According to this, we could imagine the spectator, being scattered within the space of the theatre, or the book, becoming the spectacle. This process is similar to Vitruvius' dismemberment of the human body within his *Ten Books on Architecture*, or the scattered pieces of Orpheus that end up in Lesvos to take shape in the form of a shrine.

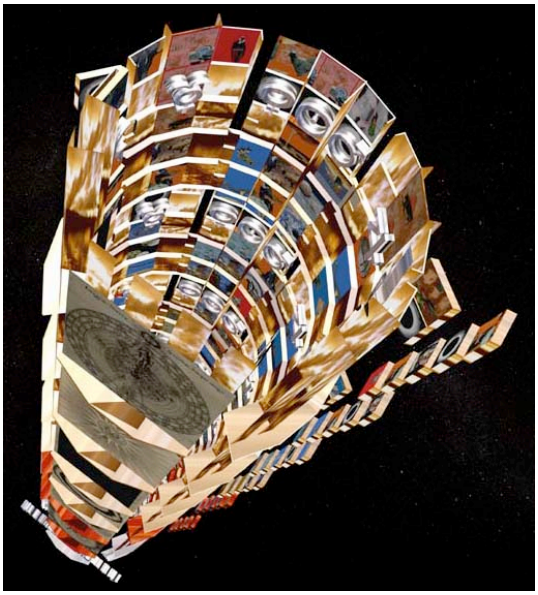


Figure 45 Kate Robinson, interpretation of Camillo's memory theatre. From *A Search for the Source of the Whirlpool of Artifice*, Edinburgh, 2006.

Based on Yates's grid-like arrangement of Camillo's theatre, Robinson claims that this mnemonic structure follows more of a tree-like form than a zoned one. According to her, Camillo used and developed 'mnemonic trees' (fig. 46) as a system of organising information: 'A mnemonic tree will begin with certain basic premises or

[174] Kate Robinson, *A Search for the Source of the Whirlpool of Artifice: The Cosmology of Giulio Camillo* (Edinburgh: Dunedin Academic Press, 2006).

ideas, which are then developed in branching structures.'[175] This leads to a different spatial reading of Camillo's theatre: Robinson concludes that it resembles a chaotic spatial branching structure that recalls the internet, with knots, multiple routes, random connections and re-connections based on a strict 'solid' tree-like structure (fig. 47). Yates herself had also the intuition to relate mnemonics to the development of the internet and cybernetics in her essay from her speech delivered at the AA.[176]

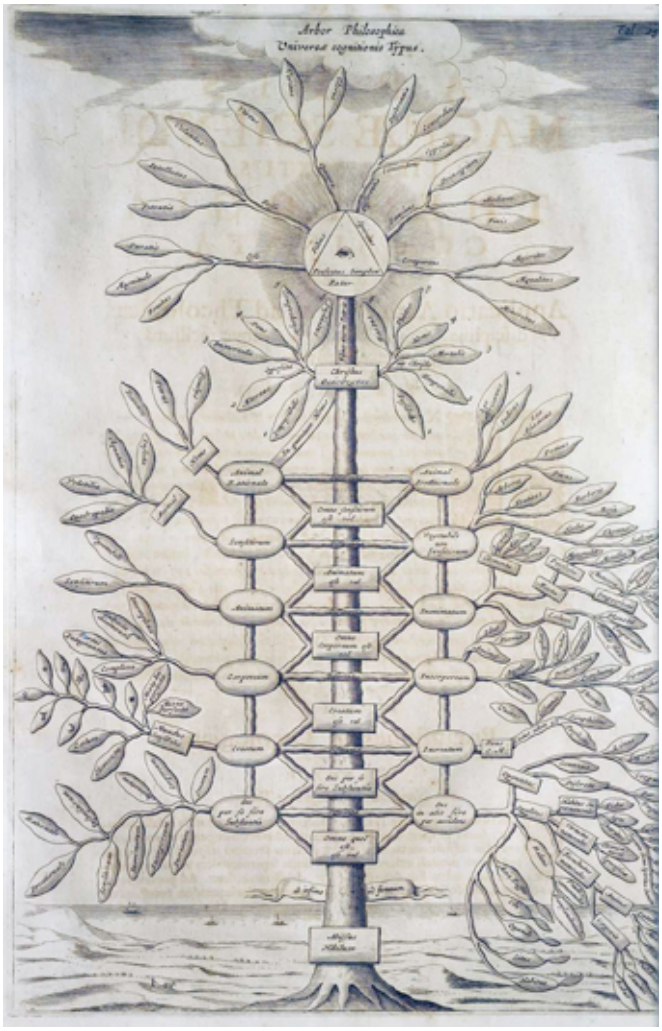


Figure 46 Athanasius Kircher, mnemonic tree. From *Ars magna sciendi*, Amstelodami, 1669.

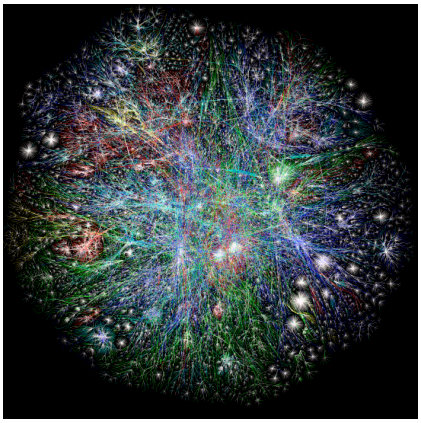


Figure 47 Map of the internet by the OPTE project, 15 Jan 2005.

[175] Ibid., p. 35.
[176] Yates, 'Architecture and the Art of Memory'. Also, cybernetics used to be taught at the AA by Gordon Pask, cybernetician and psychologist (1928–96).

In both in Yates's and in Robinson's readings, the human occupies the centre of this diagrammatically zoned, or branched, space, demonstrating how Camillo tried to fracture and disperse the human body[177] and recreate it after filtering it through the experience of all existing knowledge, more or less like Bruno's palindromic emblem 'Hostis non Hostis', which describes the actions of the moths towards fire.

According to Bruno, matter is considered to be more a 'principle' than a 'cause',[178] and as a result is constantly mutated within nature. From these endless mutations the intellect can still grasp instances of the higher 'unity of reason', of the ideas inherent in things. The higher the 'unity of reason', the less intelligible and more fragmented reality is, and the opposite: 'However, dispersion in matter does not prevent human beings from recognising, in the vestige of the intelligible principle presented by nature, fragments of single ideas which reflect their own light as in so many small mirrors.'[179] Camillo's theatre could be viewed as such a fragmented mirror of the cosmos, reflecting both the intellect externalising its view of reality and matter itself. The structure of the Memory Theatre – either zoned or branch-like – is a fractured mirror not only of the world but also of the human as the occupant becomes part of the world, a process which brings the intellect closer to a more metaphysical state of knowledge, very similar to experiments today with virtual reality or the metaphysical representation of the one-dimensional space of the internet shown above (fig. 47).

According to Yates, within Memory Theatre 'on the fifth grade, the soul of man joins his body. This is signified under the image of Pasiphae and the Bull which

[177] 'Thus Camillo's Theatre represents the universe expanding from First Causes through the stages of creation'; 'Though there are unorthodox elements … in Camillo's system, his grades contain obvious reminiscences of the orthodox days of creation.' Yates, *The Art of Memory*, pp. 145–46.
[178] Alessandro G. Farinella and Carole Preston, 'Giordano Bruno: Neoplatonism and the Wheel of Memory in The "De Umbris Idearum"', *Renaissance Quarterly* 55, no. 2 (2002), pp. 596–624.
[179] Ibid., p. 606.

is the leading image on the gates of this grade … The last image on each of the gates of this grade is to be that of the Bull alone, and these Bulls represent the different parts of the human body and their association with the twelve signs of the zodiac …'[180] Camillo's theatre, as well as the *L'Idea del Teatro*, seems to have the ability to transfer this experience of knowledge, as a solid and experiential imitation of the world, where human beings dwell and redefine themselves.

Yet it seems that Camillo, when close to his death, decided to reveal the secret of the Memory Theatre and narrated the details of his life project instead of leaving any drawings or images. Is it because there weren't any drawings made for a project he spent his whole life on? Was the entirety of this structure designed within the artificial memory of the mnemonist? Or was it a conscious decision to re-design his structure in the form of a book? It is difficult to answer these questions, and possibly all the drawings and images, if there were any, were lost over time. But it is difficult to believe that Camillo for his life project – which also had to be transferred from Venice to France and re-built – didn't make any drawings or sketches as directions for his employees or carpenters, especially when it was about such a highly visual and decorated structure that also operated in a unique way. And it is remarkable that, although there are no images left, the Memory Theatre still managed to influence – according to Yates – Renaissance thought, imagery, the development of mnemonics as an art and theatre's evolution. Possibly Camillo, as a mnemonist, aimed to set up Memory Theatre operations within the mnemonic space of a book, creating a space similar to the ancient comic poets' cubic poetry, referenced by Vitruvius, a space that leaves no traces behind. Probably Camillo avoided drawings, in a similar fashion to Vitruvius, who believed drawings to be inadequate to express his vision of

[180] Yates, *The Art of Memory*, pp. 144–45.

architecture. All these are speculations, but we could just observe that what finally remains of Camillo's Memory Theatre is a book, *L'Idea del Teatro,* and that his own intention at the end of his life was to narrate his building rather than sketch it or draw it. It is also remarkable that the structure that influenced the evolution of the Globe Theatre, and theatre's typology in general, is all included in *L'Idea del Teatro*, and that in all descriptions of the Memory Theatre the actual architectural structure and the book coincide, making it very difficult to distinguish what refers to the building or the text and what refers to the object and its memory. I believe that Camillo, as a mnemonist, recognised books' ability to open up a space of experience totally different from the one of drawing (at least in its Renaissance form): a book-space that breaks up the distance between object and viewer, spectacle and spectator; a space that is experiential, where the human being is able to get dispersed, scattered and re-invented through knowledge – a book-space very similar to the experience of the space of the actual building. The methodology used for a book to be experienced like the actual Memory Theatre could be mnemonics, a craft of memory that gives directions as to how language's material could be used spatially or architecturally; could be divided, arranged and structured within memory in such a way that a narrative could draw a more suitable representation of a building than a drawing, moving from incorporeal mind perception to the corporeal perception of reality and then back again, as Viglius commented when he visited the Memory Theatre. This double motion is a palindromic characteristic as described in the 'Defintion of the Palindrome' and examples like Camillos' help to find the link between a tradition of spatial writing and architecture.

Although Camillo's description is highly structured – seven zones with separate themes, ornaments, gates, cabinets, texts – and everything seems to outline a

very detailed structure based on a plan, the text concerning this plan seems to be more open to interpretation than any image or drawing of it. This is clearly demonstrated by Yates's and Robinson's diagrammatic designs, drawings and sketches, which are based on individual readings, knowledge about the subject, new findings and different intentions (one academic and the other artistic), cultural contexts and media (one made by hand, the other by computer).

In her essay 'The Emblematic Conceit in Giordano Bruno's *De Gli Eroici Furori* and in the Elizabethan Sonnet Sequences',[181] Yates demonstrates that Bruno (contemporary and friend of Camillo), in *De Gli Eroici Furori*, a collection of emblematic poetry, uses speech and writing to *draw* his emblems, and although an emblematic book, it does not contain any drawings. 'In one of its aspects the *Eroici Furori* is an illustrated emblem book and as such has, or should have, a place in the history of emblem literature.'[182] Instead of drawing, Bruno is using poetry and poetic forms like the palindrome to create his emblematic images and articulate their meaning and experience.

According to the above it seems that, for the mnemonists, text and in particular poetic forms expressed on paper, like the palindromic ones, have such an ability to draw or create an experience of space similar to the architectural one. Camillo's drawing of the *Artificiosa Rota* (Artificial Wheel) (fig. 48) could demonstrate such a possibility. According to Robinson:

> The *artificiosa rota* worked on the idea of uniting literary opposites. Material, or topics – ideas in literary form – were placed at each position on the spokes of the wheel, arranged in such a way that the reverse, or opposite, of a topic was placed on each opposing spoke, for example, 'arrival' and 'departure' … According to Camillo, it was inside the **whirlpool of artifice**, at the centre of the imaginary wheel, that his rhetorical game was played. His simile of a

[181] Frances Amelia Yates, 'The Emblematic Conceit in Giordano Bruno's *De Gli Eroici Furori* and in the Elizabethan Sonnet Sequences', *Journal of the Warburg and Courtauld Institutes* 6 (1943), pp. 101-121.
[182] Ibid., p. 105.

whirlpool was not accidental. In the centre of the whirlpool there was space for the hidden and uncontrollable, a space for language, for the sign, to disintegrate and re-form. He thought that here material opposites could be reconciled, material changed, transmutation made possible. All of Camillo's work was dedicated to the search of the *locus* of transformation.[183] [emphasis added]

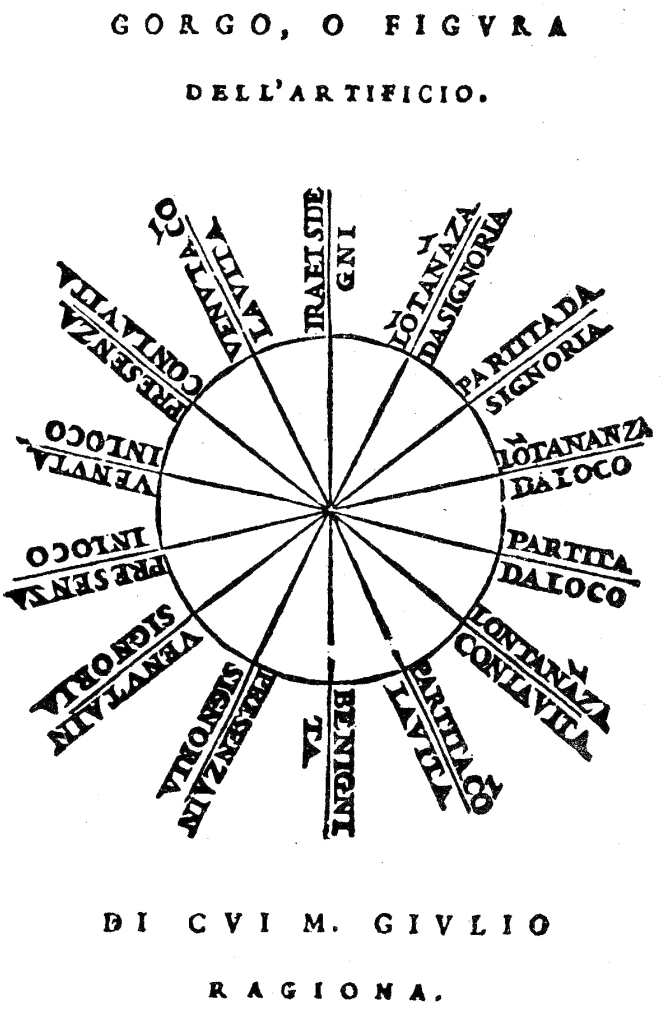


Figure 48 Giulio Camillo, *region of artifice,* memory wheel.
From *L'Idea del Teatro e altri scritti di retorica*, Torino, 1990.

This wheel of opposites designed by Camillo, like his mnemonic trees, is more than a graphical representation of an argument and operates like a space of argument, a region of the mind structured by these opposing ideas, which when set in motion and rotated could create a whirlpool of artifice. There is a tradition for such rhetoric

[183] Robinson, *A Search for the Source of the Whirlpool of Artifice: The Cosmology of Giulio Camillo*, p. 19.

wheels within the practitioners of the art of memory. The first example comes from Llull (fig. 19), who designed memory wheels where concepts could rotate around a centre, creating multiple combinations of meaning. Examples of such memory wheels can be found also in the work of philosophers like Bruno (fig. 49), Guillaume Postel (1510–81), Athanasius Kircher (1602–80) (fig. 50) and later Leibniz (fig. 51).

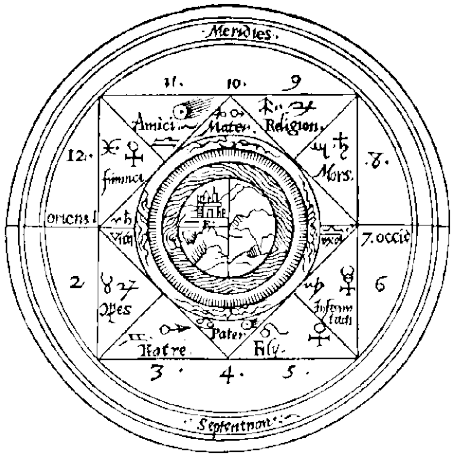


Figure 49 Giordano Bruno, memory wheel. From *Ars Memoriae*, Parissis, 1582.

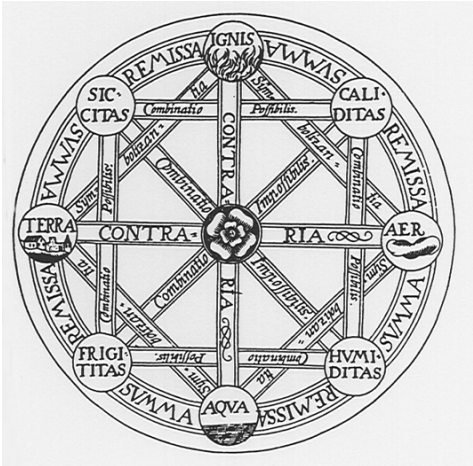


Figure 50 Gottfried Wilhelm Leibniz, memory wheel. From *De Arte Combinatoria*, Lipsiae,1666.

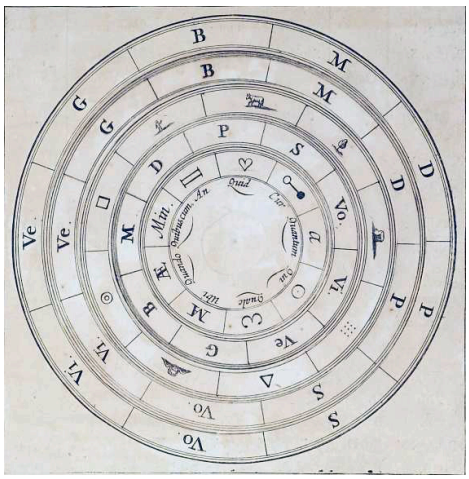


Figure 51 Athanasius Kircher, memory wheel. From *Ars magna sciendi*, Amstelodami, 1669.

Leon Battista Alberti's (1404–72) famous cipher disc,[184] (fig. 52) in his work *De Cifris* (*A treatise on Ciphers*), could be considered a *memory wheel*. Alberti's disc is composed of an external and internal disc that could be rotated in order to codify messages.

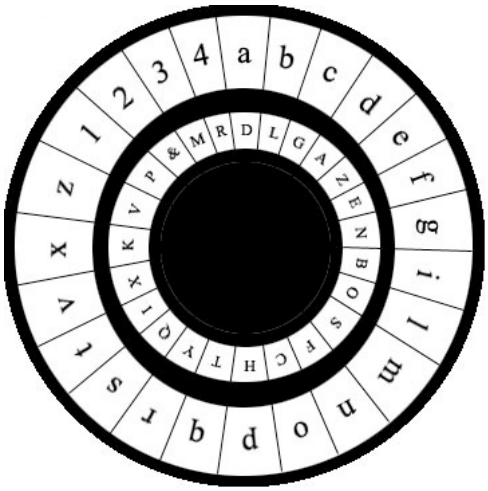


Figure 52 Leon Battista Alberti, cipher disk, 1467.
From *A Treatise on Ciphers*, Torino, 1997.

Camillo himself underlines his drawing Artificiosa Rota (fig. 48) as a 'ragiona' (region) where opposite forces contract and detract, oppositional pairs of forces that we could compare to those that give a dome or a vaulted architectural form and create a region of experience: a rhetoric space. Camillo's example is very similar to Cesariano's 'Harmonic Regions' defined by palindromic distribution of letters, analysed before, both being spaces or regions of arguments generated by mnemonic operations. Most of the pairs on the wheel are based on the bi-polar relation between the pairing concepts of 'lontananza' (distance) – 'presenza' (presence); 'partita' (leaving) – 'venuta' (arriving); 'da' (from) – 'in' of some positions like 'signoria' (governing authority); 'loco' (actual place, position), 'vita' (life). The central axis of

[184] Leon Battista Alberti, *A Treatise on Ciphers*, trans. A. Zaccagnini (Torino: Galimberti, 1997).

the circle is dedicated to the pair of 'begninita' (benignity) – 'tratei' (to deal, to treat) 'sdegni' (indignation, resentment). These symmetrical pairs of literary forces seem to have the ability to keep the space of the argument from being dispersed and, when incorporated within a poetic or architectural structure, to create the necessary balance for the generation of this space. It is the same as the laws of symmetry and mathematics that keep together Vitruvius' ten books and create the body of architecture and the Roman Empire as a whole. It is a hidden structure within the literary body that has the ability to generate a whirlpool of experience. And this circle of the artificial wheel stands for a three-dimensional representation of a space experienced within memory, like a building experienced through a drawing, with the eyes closed or after we have left it.

Carruthers in her introduction to the new edition (2008) of the *Book of Memory*[185] underlines the importance of oppositional pairs within the practice of the art of memory. According to Carruthers, for the art of memory, forgetting was not seen as a 'failure of knowledge'[186] but as a necessary condition for remembering. It is like Bruno's palindromic emblem *Hostis non Hostis*, where the butterfly's *death* from its inclination towards fire was less a condition and more a process towards knowledge. Carruthers claims that in the art of memory there was a distinction between the failure to learn something by heart and the deliberate action of forgetting something in order to remember something else. According to this, Camillo's oppositional pairs could possibly be treated more like distinct mental processes – or *discrete tactile units*, as in Vitruvius' book(s) – antithetical forces able to create spatial experience rather than conditions charged with a psychological or emotional association between good and evil or positive and negative. In Camillo's wheel, the

[185] Mary Carruthers, *The Book of Memory: A Study of Memory in Medieval Culture*, 2nd ed., Cambridge Studies in Medieval Literature (Cambridge: Cambridge University Press, 2008).
[186] Ibid., p. xi.

relation between concepts is not linearly oppositional, but as they evolve in time takes the form of a whirlpool. The experience occurs in the centre (or the eye of the vortex); each of the pairs is necessary for the experience of the whole, but separately they are of different importance. Each pair's motion individually is linear, two-directional, but all of them as a whole move to a three-dimensional representation of space, while the value of time creates the spiral experience of the *whirlpool of artifice*. The focus is not on the pairs, as pairs, but on the whole or on the space created at the centre of them – more similar to the experience of a dome, where you tend to forget the structure behind the object and are left with the object itself. Similarly, a dome could cause emotional and psychological responses as a reaction but not only as a conscious mental process between its individual elements. For example, in the next illustrations from Athanasius Kircher's *Ars magna sciendi* (1669)[187] we can see the image of the *memory wheel* being represented by a dome (fig. 53). The elements of the wheel take the form of structural elements of the dome, such as its columns, capitals, the oculi (eye), while some of them are being personified by human figures.

But if the above process occurs for antithetical pairs of concepts, it is exactly the same for palindromic pairs of concepts and in general for palindromic forms, which are by definition antithetical and oppositionally symmetrical. And the space or region of the palindromic argument is the one that is traditionally related to domes and arches.

[187] Athanasius Kircher, *Ars magna sciendi,* (Amstelodami, Janssonius `a Waesberge, 1669).

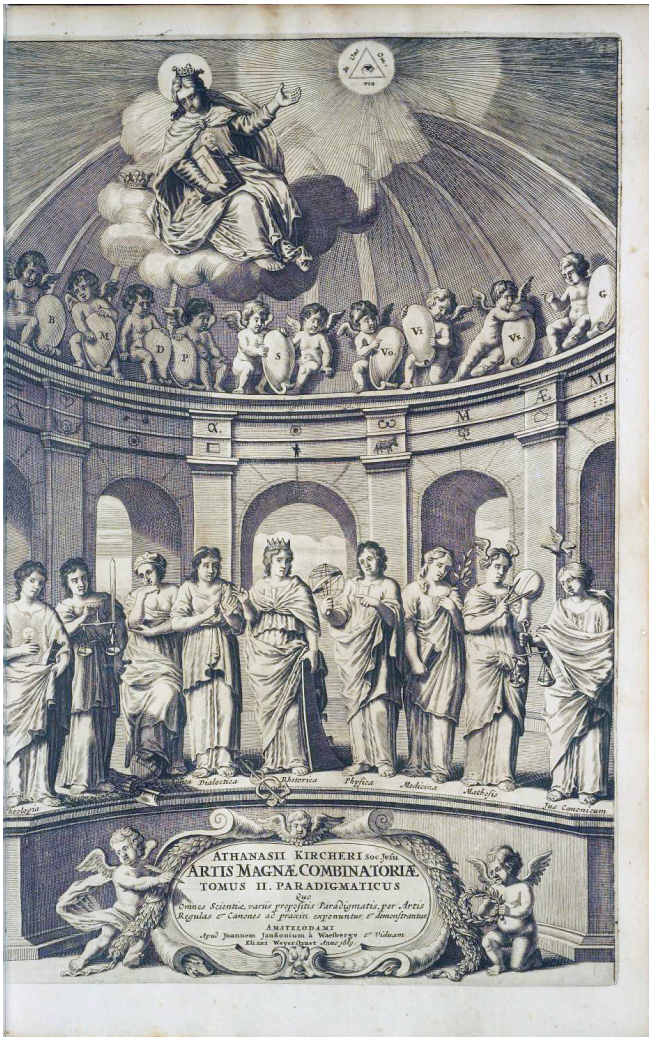


Figure 53 Athanasius Kircher, memory wheel in the form of a dome and its elements personified. From *Ars magna sciendi,* Amstelodami, 1669.

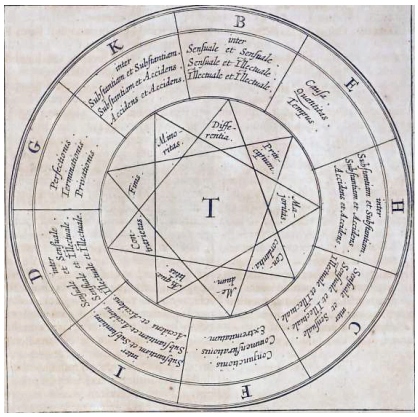


Figure 54 Athanasius Kircher, memory wheel. From *Ars magna sciendi,* Amstelodami, 1669.

In Camillo's artificial wheel (fig. 48) there is a mechanism embedded within the text that operates within a space of memory with the ability to create a harmonic region of the mind; a space of experience like the harmonic regions in Vitruvius' books, like the palindromes written on fountains, the combinational literature of Raymond Queneau, OuLiPo and Georges Perec, which will be analysed later. But mainly this whirlpool or literary edifice of oppositional pairs will be found also later in Mallarmé's image of the whirlpool, in his poem *Un Coup de Dés*, structured around

the palindromic symmetries in the middle of his poem/book. Mallarmé himself uses the image of the whirlpool in his poem as a comment on the use of language discharged or disassociated from the conventional linearity of meaning. Like Camillo, Mallarmé in the eye of the hurricane creates the space of hope for the captain of his ship/wreckage, which is language itself.

Camillo's wheel is not just the visual representation of an argument on paper but rather a mechanism that could be operated by someone's memory and imagination. This circle could be viewed as a diagram or a user's manual for the spatial transposition of an argument, and this is the point where the axis of this *rota* (wheel) could start to move and rotate, extend in time and create the experience of space. This artificial wheel could be viewed as a representation of a space on paper, an architectural drawing which, once its mechanisms are learnt and decoded, could be translated to a space, first within imagination and then externalised. It is not that Camillo's wheel circles actually move as, at the end, they remain fixed on paper; the individual reader moves around them, in the space created by them – just as in the drawing from Kirchers' book (fig. 53), which represents such a literary wheel as a dome, where meaning is produced as a movement in space. Within this dome all of its constituents, elements, disciplines, columns, planets, zodiacs, letters are fixed within their zones, but it is the individual's movement within the space produced by them that generates the combinational forces of meaning. Similarly Camillo's *Memory Theatre* could be generated by a movement of imagination when you enter the structure itself, as a building or a book. *Memory Theatre* consists of seven zones, which like the *memory wheels* are able to reconstruct a combinational mechanism, a nexus of perceptional and conceptional connections for the experience of knowledge, or the world as a theatre.

If we try to combine or superimpose Yates's analysis of Camillo's *Idea del Teatro* and her diagrammatic representation based on Vitruvian theatre, the Globe Theatre, Camillo's *artificial wheels* and Kircher's drawing of a memory wheel as a dome, her drawing can be expanded and mirrored (fig. 55) as a version of Camillo's theatre: as a circle, or as a *memory wheel*, with the human in the middle; with the seven grades/zones developing from the centre, which generated by a combinational mechanism of meaning could be able to be rotated like a wheel and create the *whirlpool of artifice* – an image very similar to Barbaro's rotating theatre in his commentary on Vitruvius' *Ten Books on Architecture*.

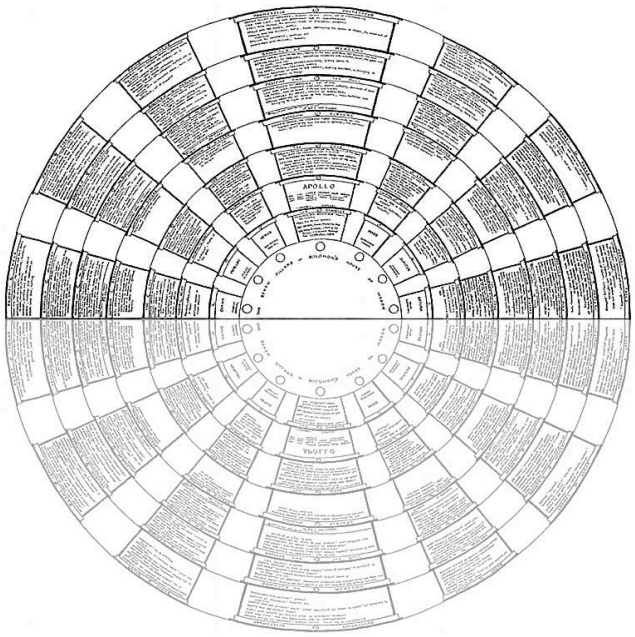


Figure 55 A conceptual interpretation of Frances Yates reading of Camillo's *memory theatre*. Produced by author.

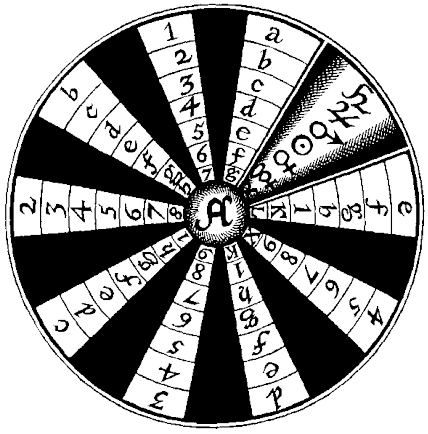


Figure 56 Giordano Bruno, memory wheel. From *Ars Memoriae*, Parissis, 1582.

Going back to the case of the palindrome, when expressed in similar shapes and arrangements it was more than a graphical representation: it was a spatial expression of an argument, a sort of whirlpool of artifice. Words had a multiplicity of meaning, which according to more recent terminology could be described as a non-

linear relation between the sign and its referent. The poetic space generated by the breaking up of linearity instigated by the anagram, as suggested by Baudrillard, is possibly rooted in such a spatial disposition of language as occurred with medieval and Renaissance word machines. The word participated actively in the architecture of the world, and it seems that with mnemonics was developed a methodology such that language's infinite combinational qualities were extended to a spatial realm; they were able not only to describe but also to construct space in paper and memory. The palindrome becomes not just an arrangement of words based on a geometrical law but a web of combinational possibilities of language and a fragmented mirror of reality's corporeal signs, as shown by Camillo's whirlpool of artifice, formed around his memory wheel of palindromic concepts.

Structuralism and Post-Structuralism

Saussure and Structural Linguistics

In Antiquity and in Mnemonics, thought was formed in the invisible geometric space of memory. This kind of 'memory works by association',[188] and palindromes give us the opportunity to examine this up to a degree arbitrary association, between the space of words and text and the space of memory. Mnemonics do not refer in general to all the functions of memory as they are conceived now[189] but to its pictorial-spatial-locational characteristics. A similar arbitrariness of associations characterises the basis of Saussure's linguistic theory and the beginning of structural linguistics and semiology. Saussure revolutionised the study of language by inventing a system where language could be studied as an abstract system[190] like any other science, detached from cultural, political and historical correlations.[191] Language, according to Saussure, can be viewed as an object or a 'machine' whose parts are the signs and the relations which between them put this 'machine' in operation. Saussure's theory is based on the concept that language is a 'sign system', where each 'sign' comprises a 'signifier' and a 'signified'. The signifier is the 'sound-image' (in oral language) or the 'image' (geometry of the letters in the script) of the sign, and the signified is the

[188] Carruthers clarifies this arbitrary association, which was analysed first by Aristotle: '*Memory works by association.* Its connections are thus individual and particular, not universal – though they can of course be learned. The logic of memory is essentially "arbitrary", in the Latin sense – dependent on one's experiences (including everything one has learned), desires, and above all will: recollection, like all creative thinking, is thus largely driven by will and desire.' Carruthers, *The Craft of Thought*, p. 8.
[189] Carruthers, for example, draws the distinction between recollection as it was meant by the mnemonists and how it is meant now: 'Their basic assumption that recollection is about recovering a number of previously stored images from mental places, differs greatly from ours, that recollection is about recovering previously stored memories over time'. Ibid., pp. 12–13.
[190] 'Language, the simple repertory of isolated concepts separated from discourse (words), is an abstraction. Saussure's boldness lies in treating this abstraction as a concrete substance, a material prima …' Jean Starobinski, *Words Upon Words: the Anagrams of Ferdinard De Saussure*, trans. Olivia Emmet (New Haven and London: Yale University Press, 1979), p. 4. 'Saussure made text as an autonomous object.' Terry Eagleton, *Literary Theory: An Introduction* (Indianapolis, Cambridge: Hackett Publishing Company, 1996), p. 86.
[191] 'Structuralism, in a word, was hair-raisingly unhistorical'. Eagleton, *Literary Theory*, p. 95.

meaning that has been invested in this 'image'. The relation between signified-signifier is made by association and is arbitrary, but the relation between the sign and its referent is also arbitrary. It is significant that this theory developed from Saussure's study of anagrammatic poetry and, more particularly, the study of the Saturnian verses[192] and hypograms (hypogram comes from the words ὑπο-hypo, which means under, and γραφή-graphi, which means scripture). Saussure acknowledged that in the anagram is 'a text within the text, or a pre-text, in the literal sense of the word',[193] where mathematical/geometrical laws have been applied to the 'primary material'[194] of language. Possibly the abstract use of the 'raw' linguistic material in the anagram provided Saussure with the insight that language is an abstract system of signs consisting of materiality (visible) and meaning (invisible). Once more, the visible is related to geometrical form and the invisible to meaning, but this time not in the space of memory but in the space of language itself. To quote literary critic Jean Starobinski (b. 1920), Sausure himself uses the metaphor of water to describe the sign-system of language which denotes also the sign's narcissistic character:

> In one of the most arresting metaphorical images of the *Cours*, Saussure compares the way thought combines with sound to the contact between air and water (CLG: 156). What the observer sees as surface ripples are shapes caused by local variations in pressure between the mass of air and the mass of water. However strained and curious the reader may find this comparison, it is at least clear why Saussure invokes it. The intention is evidently to drive home two points. First we should not think of language as constituting some mysterious third layer which mediates between thought and expression:

---

[192] According to one of Saussure's letters quoted by J. Starobinski, in saturnian verses there is a symmetrical arrangement of the linguistic material that follows three basic rules:

1. 'A vowel can take its place in a Saturnian line only if there is also a *counter vowel* somewhere in the line.'
2. 'The law of consonants. This is identical to the law of vowels and no less strict.'

'If there is an irreducible residue, either among the vowels … or among the consonants … one finds it reappearing in the next line as a residuum, corresponding to the overflow of the preceding line.'Starobinski, *Words Upon Words: the Anagrams of Ferdinard De Saussure*, p. 10.

[193] Ibid., p. 11.

[194] 'When Saussure turns to the metrics of Saturnian verse, he cannot for long confine himself to considerations of the preponderant function of accent, or of quantity. He looks for additional rules. Those which he finds are in the strict sense rules for the use and allocation of primary material.' Ibid., p. 9.

> between air and water there is no intermediate layer, and yet the interface is configurationally articulated. Second the configurations at the interface are *simultaneously* configurations of *both* the masses in contact, and the indentations match exactly; the fact that we see them as ripples on the water and not as ripples in the air is simply due to the fact that for us the water is 'visible' whereas the air is 'invisible'. Similarly the sound of a word is perceptible, whereas its meaning is not: but neither has a separate linguistic existence.[195]

According to Saussure, the geometry of words becomes the carrier of meaning and the letters form the basis for the formation of thought. Thought is not located in the geometric space of memory facilitated by letters and text (mnemonics) but in the abstract geometry of letters and of language itself. If letters can create space it is because of their own particular geometry, and their combinations and arrangements are never disconnected from their meaning. Memory facilitated by the text is not outside within a mental landscape/structure created by the orator but inside the very same structure/landscape of language.

Although arbitrary, the relation between sign and signifier/signified is linear: for example cat is not cup or cap but is always cat; it cannot be something else. In the 'dislocation' of the sign from its object, the Russian formalists located the 'poetic' because, according to them, the form of the poetic text 'allows the sign a certain independence as an object of value in itself'.[196] Roman Jakobson, Russian linguist and literary critic (1896–1982), defined the poetic metaphor as the substitution of one sign by another (like passion/flame) and poetic metonymy as the association of one sign with another (like wing/aircraft); according to him, 'the poetic function projects the principle of equivalence from the axis of selection to the axis of combination' (similar to combinatory memory wheels)[197] because we string words not only according to their meaning but also rhythmically or phonetically. Lotman viewed the 'poetic text

[195] Ibid., p. 30.
[196] Eagleton, *Literary Theory*, p. 85.
[197] Ibid., p. 86.

as a stratified system in which meaning only exists contextually, governed by sets of similarities and oppositions'. It is 'a system of systems' and is the 'most complex form of discourse imaginable', 'where even absence of certain devices may produce meaning'.[198] According to Lotman, the 'poetic text' is so complex that 'a poem, in fact, can only be re-read, not read, since some of its structures can only be perceived retrospectively';[199] but the palindromic poetic structure seems like a literal manifestation of the above claim, as within the very structure of palindromic 'poetic text' has been incorporated the action of the retrospective re-reading of the poem, in different directions, movements and times.

[198] Ibid., p. 89.
[199] Ibid.

Post-Structuralism

In post-structuralist thought the relation between signifier and signified breaks up completely and meaning 'is the spin-off of a potentially endless play of signifiers rather than a concept tied firmly to the tail of a particular signifier'.[200] Language acquires spatial characteristics and moves in time and space:

> instead of being a well-defined clearly demarcated structure containing symmetrical units of signifiers and signifieds, it now begins to look like a sprawling limitless web where there is a constant interchange and circulation of elements, where none of the elements is absolutely definable and where everything is caught up and traced through everything else.[201]

In this post-structuralist context Baudrillard located in anagrammatic structures the opening to a space of the interchange of signifiers, where the 'poetic' is not only a dislocation of the sign from its referent but a spatial and temporal movement. In *Symbolic Exchange and Death*,[202] Baudrillard, taking further Saussure's research on the anagram, finds inside the structure of the anagram the proof that a signified may have multiple signifiers. In the case of the palindrome, for example, the movement between the sign and its referent is constant and embodied in the poetic structure – a forwards and backwards movement which at the end coincide, leaving 'nothing'. As we have witnessed in medieval and religious poetry, by hiding the 'name of God' in anagrammatic structures, the poets are managing to 'diffract' a theme-word inside the text, and together with this word 'exterminate the name of God' and at the same time exterminate the very structure of language. According to Baudrillard:

> It is therefore a matter not of another manner of being the Same, of reiteration or paraphrase, of a clandestine avatar of the original name of God, but rather

[200] Ibid., p. 110.
[201] Ibid., pp. 110–11.
[202] Jean Baudrillard, *Symbolic Exchange and Death*.

an explosion, a dispersion, a dismembering where the name is annihilated. Not an 'artificial double' (what use is this unless it is in order to be reduced to the same thing?), but a dismembering double, a body torn limb from limb like Osiris and Orpheus … To sum it up, this is, *on the level of the signifier, of the name it incarnates, the equivalent of putting God or a hero to death in the sacrifice.*[203]

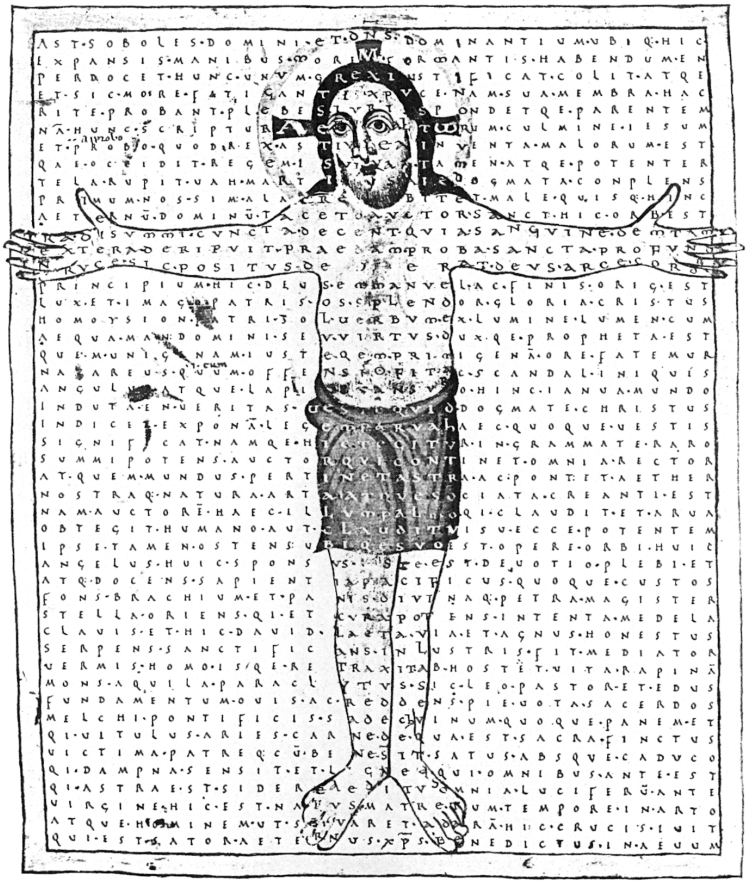


Figure 57 Rabano Mauro, visual poetry, c. 780–856. The body diffracted within poetry's space like the Vitruvian man. From Dick Higgins, *Pattern Poetry*, Albany, 1987.

In the above example (fig. 57) of anagrammatic poetry, the body of Christ is diffracted within the poem's space, a process that recalls the palindromic double-headed eagle, Orpheus' body, Vitruvian man or the ancient Greek temple.

According to Baudrillard, what *remains* from this whole procedure of consumption is what 're-enters the circuits of accumulation', what has 'not been exhausted in the incessant cycle of the gift and the counter-gift', and here is where we

[203] Ibid., p. 199.

can distinguish a 'third-dimension' which is that of the 'boundlessness, the limitless production of signifying material', where the 'signifier-signified equivalence defines an unlimited field of *discursivity*' and this third dimension makes the opening to the poetic space.[204] In this space, a single word, which has remained unused or 'not exhausted', has the power to evoke experience. Analysing this phenomenon, G.D. Martin in his book *Architecture of Experience*, describes the example of writer Judith Kerr (b. 1923), where an 'exterminated' word creates such space:

> Judith Kerr, who had been brought up in pre-war Germany, had fled to England, and had forgotten more and more of her German over the years, writes:
> 'on a recent visit to Germany a strange thing happened to me. I was on a bus, idly reading the signs above the shops in the street we were passing through, when I saw the word *Blumenladen.* Suddenly I was in different world. I was conscious of being very close to the floor, surrounded by the legs and feet of people who towered above me. There were plants everywhere, as big as bushes and trees – thick green leaves and enormous coloured flowers. It was like a jungle, and I was in the middle of it, clutching a huge hand from which a huge arm stretched up into the distance above me.
> And then I was back in the bus, a middle-aged woman on a visit from England.
> I had found a bit of my childhood, pickled in a word that had lain unused for forty years until I had happened to come across it.[205]

In this example 'the sight of the word produced a total sensory recall, as if the word were a string attached to the memory'.[206] A similar example is Perec's autobiographic novel *W or the Memory of Childhood*,[207] where a single letter unfolds a whole universe of experience.

This is a different way in which the geometry of language operates for the creation of space, unlike mnemonics and structural linguistics. In medieval mnemonics the book was experienced in the topology of memory and the anagram or

---

[204] Ibid., p. 201.
[205] Graham Martin Dunstan, *The Architecture of Experience: A Discussion of the Role of Language and Literature in the Construction of the World* (Edinburgh: Edinburgh University Press, 1981), p. 115.
[206] Ibid., p. 120.
[207] Georges Perec, *W or the Memory of Childhood* (London: Collins Harvill, 1988).

the palindrome provided the necessary geometry for this purpose. In structural linguistics the study of the anagram by Saussure played a significant part in dealing with language as an abstraction, where experience inhabits the geometric structure of language. The only law language knows that mediates the arbitrariness of the signified/signifier relation is that of memory in the form of 'tradition'.[208] For post-structural linguistics the hidden geometry of the anagram provided proof that experience inhabits the poetic space, generated by the breaking up of the relation between the signified and the signifier. A non-linear relation between signified/signifier shows that a word can be also something other than what it is; for example, in an anagrammatic arrangement the word 'cat' can mean cat but can also be part of the hidden name of God, which is diffracted in the phrase. The invisible, codified placement of diffracted letters becomes experiential space, and memory is what makes the connections between visible (letters) and invisible geometry (letters' anagrammatic associations). This is poetic space, where experience is not disconnected from memory; instead, this third dimension of the text creates the experience of a space strongly attached to the individual and personal memories.

The palindrome's main function is antithetical. Text is related to itself not only for what it is but through its absence or reversion of what it is not. A palindromic web of experience might bring us back to the Renaissance vaulted domes, not by constructing the experience of the book in the topology of memory but by becoming itself experiential (book or text). This research aims to use the palindrome to investigate this poetic space, not only in the text but also in architecture, in cases

[208] 'There is a connection between these two opposing factors: the arbitrary convention which allows free choice, and the passage of time, which fixes that choice. It is because the linguistic sign is arbitrary that it knows no other law than that of tradition, and because it is founded upon tradition that it can be arbitrary.' Roy Harris, *Language, Saussure and Wittgenstein: How to Play Games with Words* (London, New York: Routledge, 1990), p. 53.

where the symmetrical function of architectural meaning is cancelled by its own formal structure.

Greber has researched the palindrome from the perspective of semiology and gives a description of the palindrome's political characteristics. Greber discusses the recent growth of interest in palindromes in countries like Russia, Germany, Serbo-Croatia – which is also a consequence of the development of the genres of formalism, structuralism and semiotics in the same regions – and argues that this 'articulates certain political anxieties'. The revival of this linguistic form in literature and criticism may operate as

> an incantation of the symmetry of form directed against the imponderability of social change, an exorcism of political and economical disorder through the order of alphabet letters … In two other contexts of enormous political and cultural upheavals in the wake of Communist breakdown the palindrome has become topical: in Germany around 1989 and the immediate post-unification years, and in Serbo-Croatian literature between 1991 and 1995 in connection with post-Yugoslav cultural split and war. In German feuilletons, the palindrome suddenly became a topic of broader public interest with the unexpected participation of people outside literary and academic circles: a celebration of the 'velvet revolution' or already the symptom of a desire for the reversal of unification.[209]
>
> ΔAP CCCP – AΔ.[…]
>
> (Palindrome in Russian which means 'the gift of the USSR – Hell')[210]

Apart from in the unstable political regions of Eastern Europe, there has been a growing interest in this form of writing in post-modern literature, probably as a result of its antithetical character. It serves as a means of alternative forms against a more academic establishment in a time of enormous changes in the field.

---

[209] Erika Greber, *Palindrome Semiotics. A Chronotope of Revolution: The Palindrome from the Perspective of Cultural Semiotics* (accessed 4 May 2005); available from http://www.realchange.org/pal/semiotic.htm.
[210] Erika Greber, 'Biltworter, Wortbilder: Palindrom Und Ambigram Als Minimalistiche Kunstformen', *Minimalismus* (2001): 28.

Palindromic Spaces

This part, Palindromic Spaces, investigates the actual experience of space generated by the palindrome. In contrast to the previous section, this part also moves from some specific examples to the more general idea of a palindromic spatial experience.

The starting point of Palindromic Spaces is specific writers, poets and architects who have used the palindrome in their projects. We will examine their methodology, their context in relation to a tradition of spatial writing and how their examples unfold the experience of textual and palindromic space. There are four examples, two from the literary world and two from the architectural one, which are organised in two pairs. The first pair is the poet Mallarmé and scenographer Jacques Polieri. Mallarmé consciously used palindromes, amongst other devices, in his poem *Un Coup de Dés* and Polieri staged, possibly for the first time, *Un Coup de Dés* and transferred the poem and its palindromic qualities into the space of an auditorium. The second pair is writer Perec and architect Libeskind. Perec has written one of the largest and most fascinating palindromes, *Le Grande Palindrome* and used palindromes in his book *Life A User's Manual* and architect Libeskind has referred to literary ideas like the anagram and the palindrome to renovate design and the production of architectural space after modernism. All of these examples are informed by the lineage of spatial writing that we explored in the first part, Spatial Palindromes, which itself became a subject of study and inspiration for twentieth-century literary groups like the Parnassians, the Symbolists and OuLiPo.

Stéphane Mallarmé

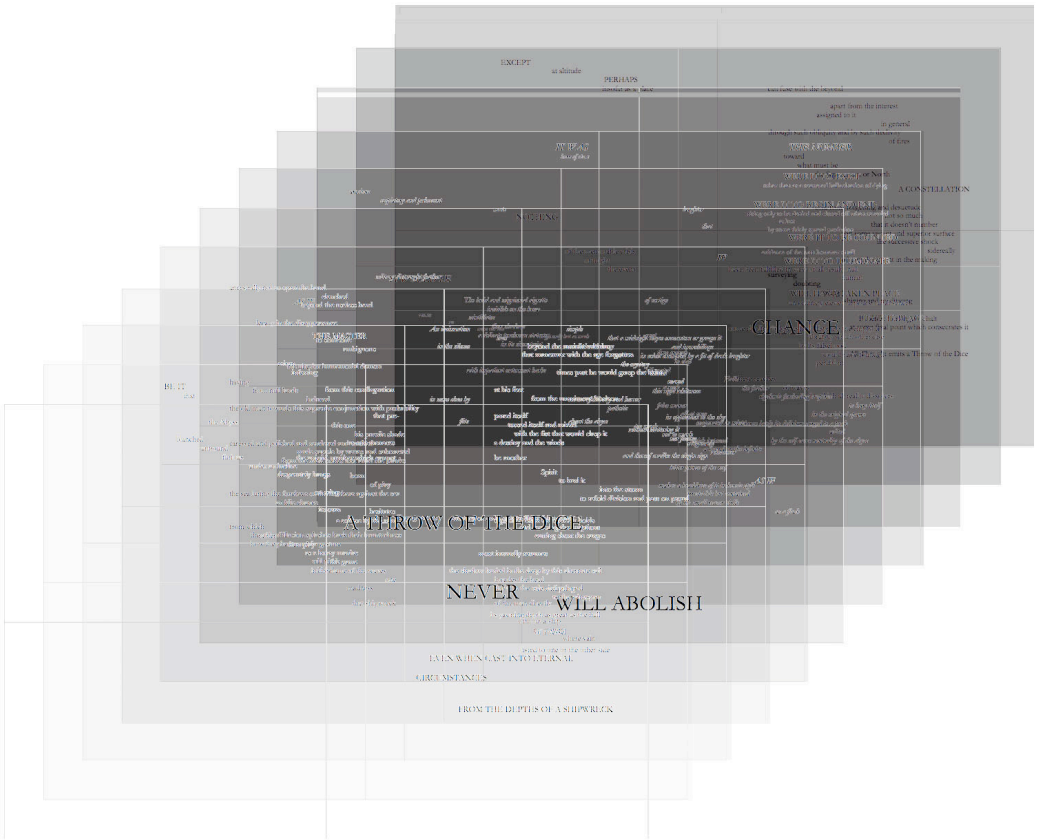


Figure 58 Axonometric study of Mallarmé's *Un Coup de Dés*. Produced by author.

Parnassians, Symbolists and Stéphane Mallarmé

This part of the thesis aims to examine how ideas on poetry, language theory and anagrams including palindromes from antiquity and the Middle Ages have influenced the development of modern ones, by considering Baudelaire, Mallarmé, the Parnassians and the Symbolists.

As a reference point, I am going to use Mallarmé's work and especially *Un Coup de Dés* (1897), which will be analysed in detail. Mallarmé is positioned on the threshold of different styles and ideas, exactly at the 'dawn' of modernism, a turning point for the research of space in arts, literature and architecture. Mallarmé's poem *Un Coup de Dés* is an example that, by looking backwards at how textual geometric space was produced, experienced and theorised in ancient and medieval religious and mystic poetry, emancipates a 'new' perception of spatial structures in text and the arts.[211] Spatial writing like the anagram and, in our case, the palindrome in the modern period shift from the mnemonic to the abstract, from the mystical or religious to the scientific, and from an expression or codification of the name of God to an articulation of the Void and nothingness. The boundaries between those pairs (mnemonic–abstract, God–Void, religious–scientific) are blurred and difficult to distinguish. I believe that *Un Coup de Dés* demonstrates the change of balance between these pairs both because of the time in which it is placed and because of its spatial qualities as a structure (text) and as a product (texts about the poem). It is Mallarmé's time-place in history in relation to his deep knowledge of older poetic

[211] According to Michel de Certeau in his essay 'Mystic Speech', the literature of mysticism provides tha path to experimentation with new concepts in language: 'The mysticism of the sixteenth and seventeenth centuries proliferated in proximity to a loss. It is a historical trope for that loss. It renders the absence that multiplies the productions of desire readable. At the dawn of modernity, an end and a beginning – a departure – are thus marked. The literature of mysticism provides a path for those who "ask the way to get lost. No one knows." It teaches "how not to return".' Michel de Certeau, *Heterologies: Discourse on the Other* (Manchester: Manchester University Press, 1986), p.80.

forms, which he applied to renovate poetry, and his conscious attempt to create, according to him, an 'architectural' and a 'spaced reading',[212] that bridge architecture and poetry in how space is structured and experienced. The idea of the architectural book comes from Mallarmé's project to create a book – the Book, *Le Livre*, as he used to call it – which was going to be 'architectural' and not only based on 'inspirations', or content.[213]

A form that could illustrate this concept of 'architectural' or 'spaced reading', and which bridges the material space of the page and the immaterial of our memory through sensory perception, is that of the dome, or the arch. This is noted by art critic Penny Florence, when she describes the idea of the *pendentif* and the recurrence of the concept of dome in Mallarmé's writing:

> Scattered oppositions are proposed, maintained and then their relation is demonstrated as a dynamic structural transposition. 'Pendentif', in its primary sense here, is an architectural term for an intersection, which is the initiator of Mallarmé's meanings … The opposition of the arches and the independence of the dome are reiterated in different forms and contexts again and again in Mallarmé's writing.[214]

The idea of the dome is more than a metaphor for Mallarmé; it is an instrument for the spatial organisation and a parameter for the comprehension of the poem. *Pendentif* has the ability to connect and separate elements on the page and through the page within the space of the book. Such an idea was found before in examples of palindromic arrangements both in books and in architecture, as in cases of

---

[212] In the preface of *Un Coup de Dés.* Stéphane Mallarmé, *Un Coup de Dés jamais n' abolira Le Hasard; Edition Mise En Œuvre Et Presentee Par Mitsou Ronat* (Paris: D'Atelier, 1980).
[213] '…the poet's [Mallarmé's] continuous, alchemical search for what he calls, with the unbound ambition of simplicity, the Book: a book which would truly be a book, architectural and premeditated, and not an anthology of chance inspirations, however marvellous those inspirations might be. What this book would offer its readers, he insists, is the Orphic explanation of the earth, which is the poet's sole duty and the literary game *par excellence*.' Rosemary Lloyd, *Mallarmé: The Poet and His Circle* (Ithaca and London: Cornell University Press, 1999), p. 4.
[214] Penny Florence, *Mallarmé, Manet and Redon: Visual and Aural Signs and the Generation of Meaning* (Cambridge: Cambridge University Press, 1986), p. 62.

anagrammatic poetry like the double-headed eagle and the use of palindromes in fountains and inscriptions.

Un Coup de Dés is a spatial object by itself but also a product; the poem is made in space and is to be experienced in space, and this is the only way it reveals its meaning. According to Mallarmé critic Virginia A. La Charite: 'Poetic gamesmanship is an important part of Mallarmé's esthetic of space, for it is in space that he moves the words/pieces and it is in space that meaning occurs.'[215] The reader is the producer of this space because they have to mobilise all of their existence to 'read' the poem, their mind, memory, knowledge as well as their moment and place in our culture. *Un Coup de Dés* is made as a scaffold of ideas within which the mind is free to travel. The space of the text is self-produced, produced by itself and by the self, and like a building cannot be seen in only one instant but can be experienced only retrospectively. Mallarmé draws the *linee occùlte* (invisible perspective lines) of the text to create space in a way similar to that in which these invisible lines create space in drawings. In both cases, the text and the drawing, these lines are the 'ideas', the invisible guidelines for the eye and the mind. Mallarmé has consciously used palindromic symmetries to construct *Un Coup de Dés* and create a spatial structure, very much like an architect who 'designs' space first on paper. This is why it is very important to examine how and why they have been placed there as well as their operation within this structure.

[215] Virginia A. La Charite, *The Dynamics of Space: Mallarmé's Un Coup de Dés jamais n'abolira Le Hasard* (Lexington: French Forum, 1987), p. 32.

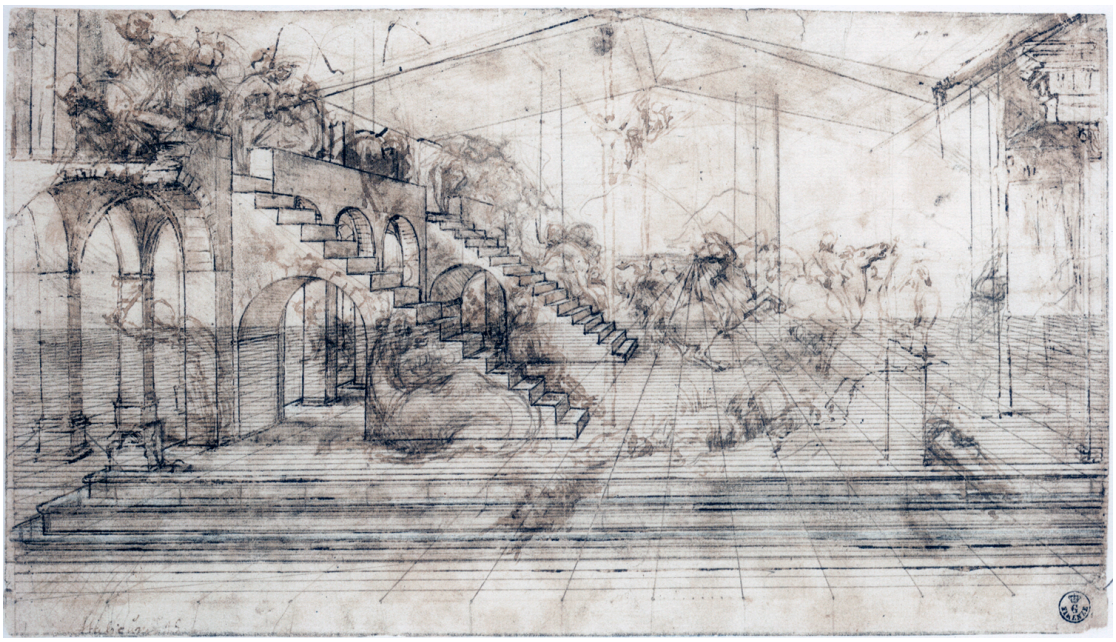


Figure 59 Leonardo da Vinci, perspective study of the *Adoration of the Magi*, c. 1480. Uffici, Florence.

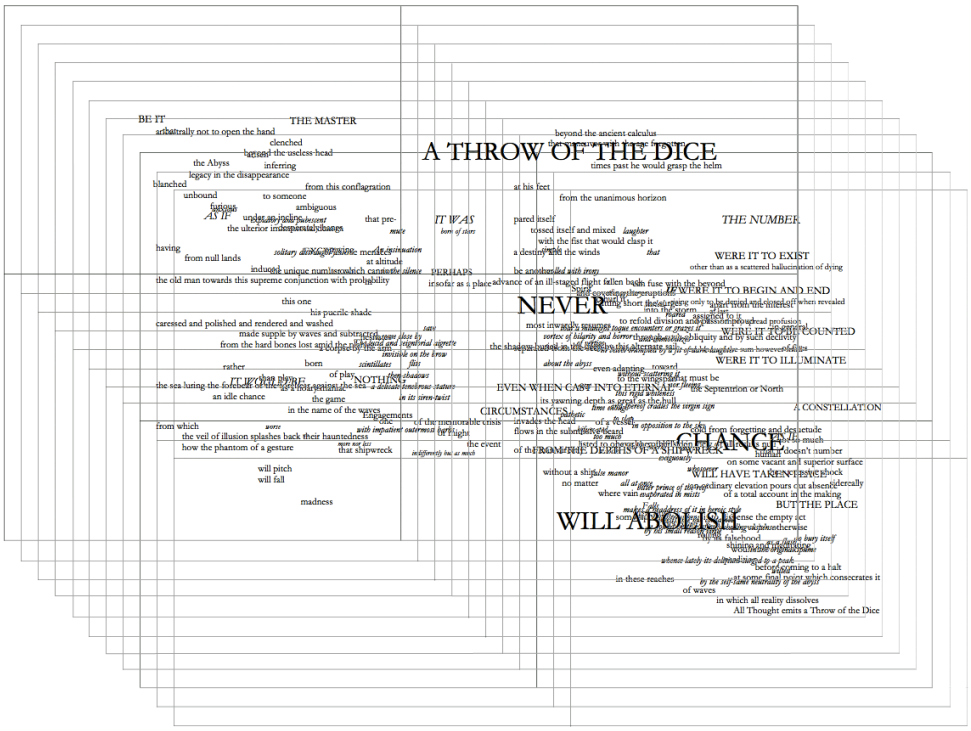


Figure 60 Stéphane Mallarmé, axonometric study of *Un Coup de Dés*. Produced by author.

The above (fig. 60) is an axonometric sketch of *Un Coup de Dés*, where the pages become transparent – 'transparent reading' – and are extended into depth. Mallarmé populated the space of the poem/book *Un Coup de Dés* with images, letters and thoughts in a similar way to Leonardo da Vinci (fig. 59), who used invisible grids and perspective lines to populate his drawing with images, events and thoughts. In both cases imagination breaks up the material limitations of the page and makes an opening to the experience of each space. Leonardo da Vinci, in the *Adoration of the Magi*, uses the perspective and grids to create an illusion of reality, but Mallarmé's poetic structure is not trying to imitate reality but to reveal the illusion of it and create the experience of the void: the empty space between what surrounds us (the real) and our perception of it (between the page and what we see or read on that page). *Un Coup de Dés* is evidence that reality is, to a certain extent, an illusion and that imagination and thought have the ability not only to perceive and understand the real (and record on paper, as in da Vinci's drawing) but to move even further from what we see as real, create new relations, new connections, and draw new lines which inform the real. It is not that drawings like Leonardo da Vinci's *Adoration of the Magi* haven't changed our perception of reality and how it is shaped – it is very well known that the development of perspectives in the Renaissance changed the way buildings and cities were made – but examples like Mallarmé's *Un Coup de Dés* seem to make a shift in the balance, as the poem becomes both the object and the reflections of it. It is self-referential, autonomous and narcissistic. The viewer is not standing in front of an image or a window from where he can see a new reality, but the image itself becomes an object, a new reality, that constantly changes and shifts together with the reader/viewer.

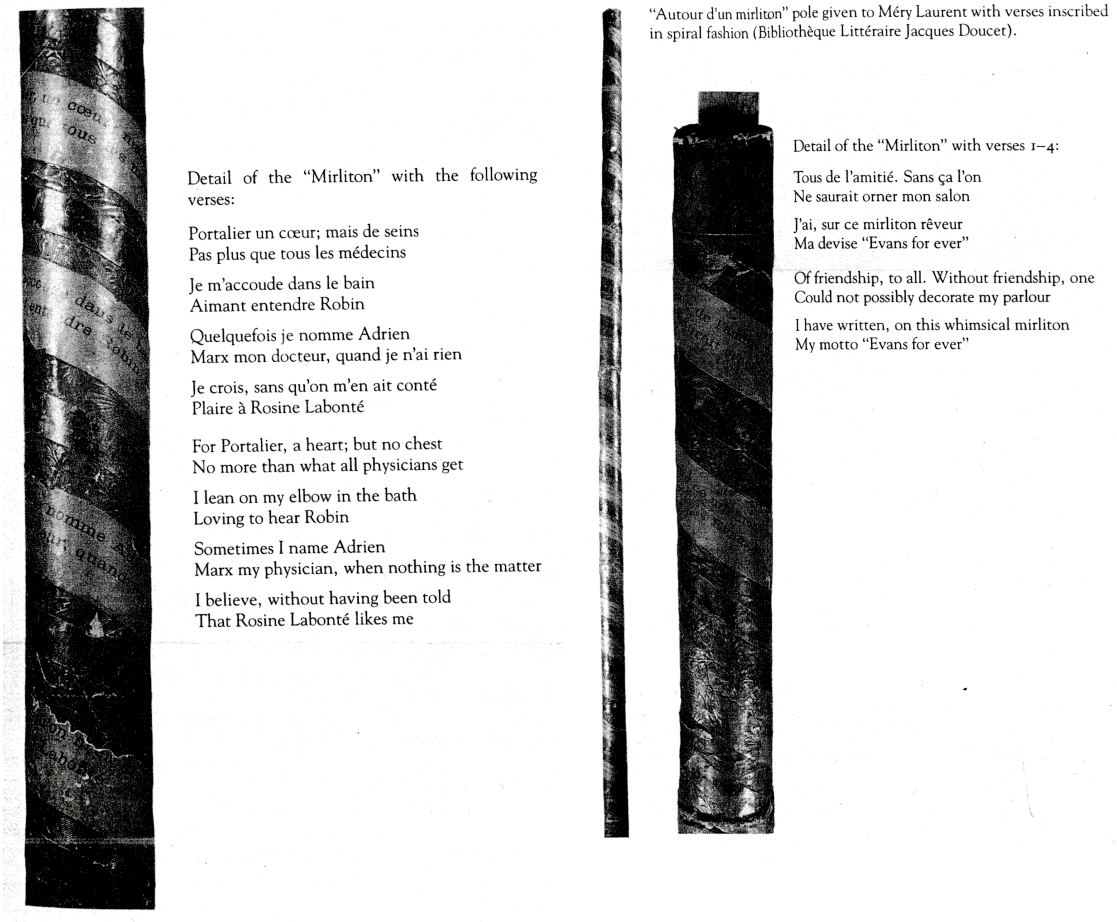
In order to read a perspective image, distance is a very important element. Perspective techniques imitate a specific angle of the eye, and the image must be looked at from a very specific angle, one decided by the artist; in *Un Coup de Dés*, however, there is no distance between object/image and viewer. In fact, there is nothing but the void, and this demonstrates a new conception of space that is not linear. It is not fixed but instead is open to many interpretations and readings. This conception relates more to the tradition of spatial writing where reading depends mainly on 'inner vision', (in)sight, imagination and memory. This change in viewing based on image and language (image of language or language of image) signified also a change of ideas that defined modernity, as we will examine in examples from Baudelaire, Mallarmé and Saussure, all of whom studied ancient and medieval poetic forms. *Un Coup de Dés'*s structure and the use of palindromes within the poem will be analysed in more detail later, but first it is important to examine Mallarmé's contribution to the development of ideas concerning text and its spatial experience.

Mallarmé had an established interest in a spatial writing; there are many examples of his writing poetry on cylinders (mirlitons) (fig. 62) on Easter eggs or on fans (fig. 61) where he folds the words in order to create others.[216] According to Charite:

> For example, in the early text, 'Brise marine', he uses the folding-unfolding fan technique to transpose the quayside scene into an exotic dream. The final lines of the text contain the evocation of the voyage and the longing of the poet for adventure: '… sans mâts, sans mâts, ni fertiles ilôts … / Mais, ô mon coeur, entends le chant de matelots!'. By folding the words *mâts* and *ilôts* into *matelots*, Mallarmé creates a mobile image of the sailors and reduces the entire text to an evocation of departure.

[216] Ibid.

Figure 61 Stéphane Mallarmé, fan for Misia Natanson. Collection Thierry Bodin.



Detail of the "Mirliton" with the following verses:

Portalier un cœur; mais de seins
Pas plus que tous les médecins

Je m'accoude dans le bain
Aimant entendre Robin

Quelquefois je nomme Adrien
Marx mon docteur, quand je n'ai rien

Je crois, sans qu'on m'en ait conté
Plaire à Rosine Labonté

For Portalier, a heart; but no chest
No more than what all physicians get

I lean on my elbow in the bath
Loving to hear Robin

Sometimes I name Adrien
Marx my physician, when nothing is the matter

I believe, without having been told
That Rosine Labonté likes me

"Autour d'un mirliton" pole given to Méry Laurent with verses inscribed in spiral fashion (Bibliothèque Littéraire Jacques Doucet).

Detail of the "Mirliton" with verses 1–4:

Tous de l'amitié. Sans ça l'on
Ne saurait orner mon salon

J'ai, sur ce mirliton rêveur
Ma devise "Evans for ever"

Of friendship, to all. Without friendship, one
Could not possibly decorate my parlour

I have written, on this whimsical mirliton
My motto "Evans for ever"

Figure 62 Stéphane Mallarmé, mirliton, where the poem is written in a spiral fashion, incorporating palindromic words. From Marian Zwerling Sugano, *The Poetics of the Occasion*, Stanford, 1992.

Mallarmé also had an interest in 'language manipulation', and there are various examples of anagrams, charades and palindromes in his work, as for example in his *Vers de circostance*.[217]

At the beginning of his poetic career Mallarmé published many of his poems under the banner of the Parnassian poets and had a close friendships with many of them, such as Charles Leconte de Lisle (1818–94), Théodore de Banville (1823–91), Paul Verlaine (1844–96) and François Coppée (1842–1908).[218] The Parnassians, a continuation of the Art for Art's Sake movement, were a reaction to the Romantic poets. Parnassians declared the autonomy of art and tried to liberate poetry from the impulsive passion of the Romantics[219] and approach it like a scientific doctrine[220] by experimenting with poetic form and the conception of 'plasticity' in fiction.[221] Parnassians believed in the importance of form and surface; if reality manifests itself through form (structure and its surface), then studying it as an object is the only way to reach the concept of ideal beauty in poetry.[222] This concept originates in Charles Baudelaire (1821–67) and the following line from 'L'Amour du mensonge' [the love of the lie] inserted in the 1861 edition of the *Fleurs du Mal*: 'Masque ou décor, salut! J' adore ta beauté' ['Mask or prop, I hail you! I love your beauty'].[223] Beauty is somewhere hidden in the surface; the mask of reality and this surface or image

[217] 'The texts must be seen to be grasped because they depend primarily on the tactile sense: "dans telle/dentelle", "Cold/Hérolde", "m'accommode/comme ode", "**rêver/ever**", "Commentaire. Comme en terre", "qu'on fit/confit".' Ibid., p. 20.
[218] *Le Parnasse Contemporain. SéRies 1–3. Recueil De Vers Nouveaux* (Paris: 1866–76).
[219] 'We may apply to the Romantics the term first employed by the Russian Symbolists and then elaborated by their critics: "life creation", in Russian "zhiznetvorchesto". It is usually understood as an imposition of an ideal or idealized grid upon everyday behaviour in an attempt to achieve a perfect aesthetic organization of life …' This reminds us also of Georges Perec's analysis of *Life A User's Manual.* Svetlana Boym, *Death in Quotation Marks: Cultural Myths of the Modern Poet* (London: Harvard University Press, 1991), p. 5.
[220] For more information on how 'scientific methodology' became a central point for the Parnassians see: Robert T. Denomme, *The French Parnassian Poets* (Carbondale, Edwardsville: Southern Illinois University Press, 1972), p. 2.
[221] 'The fiction itself appends the conception of plasticity to the notion of autonomy in art and tends to equate it with the manifestation of ideal beauty.' Ibid., p. 8.
[222] Ibid., pp. 30–31.
[223] Ibid., p. 31.

(reflection) of reality is what the poem becomes. Such an approach possibly explains why Mallarmé in *Un Coup de Dés* used poetic language in such a graphical, visual way, as we are going to examine later. In this sense the image in poetry becomes equal in importance to content, a concept which led the Parnassians and Symbolists to reject the separation between painting and poetry. For example, according to art critic Robert Denomme, in the nineteenth century 'the Romantics tended to overthrow all classical principles, including the separation of the arts. There were paintings which told stories, such as the *Burial of Atala* (1808) by Girodet-Trioson, and much poetry which revelled in description. The Parnassian poets openly tried to paint with words, encroaching freely on the territory of painting.'[224]

For their quest, the Parnassians – as their name declares – turned to ancient Greek antiquity by studying not only the ancient philosophers but also the ancient poetic forms and expressions or surfaces of reality; they looked back to an era when language, poetry and painting were merged. According to Laconte de Lisle:

> **Art and science**, separated for so long by divergent intellectual reactions, must aim to link themselves close together. Art has expressed the primitive revelation of the ideal contained in exterior reality, while science has calmly analyzed the poetic claim in order to expose it more clearly. But art has lost its intuitive spontaneity, or rather, it has exhausted it. It is now for science to infuse art with a renewed appreciation of **its forgotten traditions** so it may be enabled to crystallize them in appropriate formal expressions. [emphasis added][225]

The alliance, on the one hand, of poetry and science, and on the other, of poetry and painting, and the aim of looking backwards in order to renovate, recalls what has been mentioned before about Saussure and his description of language as a sign system. Trying to develop a more scientific methodology to analyse language as an independent system, Saussure created sign theory. According to this theory, language

[224] David W. Seaman, *Concrete Poetry in France* (Michigan: UMI Research Press, 1981), p. 5.
[225] Denomme, *The French Parnassian Poets*, p. 36.

consists of signs and each sign is composed by its signifier and signified. The signifier is the materiality of each sign, the form of letters or sounds; otherwise the surface or the mask and the signified is the meaning we attach to this form, what is behind this mask or upon which we attach this mask. Saussure developed his theory by looking back and studying ancient poetic anagrammatic forms like the Saturnine Verses. Similar research took place in the circles of the Parnassians and Symbolist poets, as for example in Verlaine's *Poèmes Saturniens,* a collection of sonnets he wrote based on the study of the ancient Latin poems dedicated to Saturn.[226]

The Parnassians questioned the representational qualities or properties of poetry by relating the ideal to the real. According to Denomme, 'what interested them was the methodology of science which they sought to implement in various fashions in their own poetry'. Within this context Mallarmé studied the 'plastic and material terms of poetry', the 'surfaces and appearances'[227] of the poem as a 'real' material object, as well as its reflections of reality. Studying relations of form/image and ideal/real, through external forms of reality and antiquity, was influential for the development of his poetry and in particular for the conception of his visual poem *Un Coup de Dés*. In this poem, Mallarmé took this question even further by merging these pairs; the poem itself becomes a continuous movement between the real – the object – and a representation of it – an image of the object. The poem becomes the object itself and an idea. Mallarmé uses palindromic symmetry to facilitate this movement in a rhythmic motion and establishes a double motional/temporal ability that cancels itself while keeping the space it creates together. Between these two (real/ideal) exists the void or nothingness. With his poem Mallarmé sets up a new era

[226] Verlaine sent a copy of *Poemes Saturnien* to Mallarmé in 1866, as we can witness in their correspondence. Stéphane Mallarmé, *Selected Letters of Stéphane Mallarmé*, ed. Rosemary Lloyd, trans. Rosemary Lloyd (Chicago and London: University of Chicago Press, 1988), p. xvi.
[227] Denomme, *The French Parnassian Poets*, p. 31.

for poetry and visual arts;[228] for the creation and experience of spatial structures. This is probably why philosopher Roland Barthes (1915–80) claims that modernism begins with Mallarmé.[229]

It is important to note Mallarmé's relations to the Parnassians and to the Orphic movement because palindromes were related to the ancient religion of Orpheus. All these show that Mallarmé was familiar with ancient and modern attempts and experiments with structural and geometrical poetic forms and a tradition of spatial writing that found expression in his *Un Coup de Dés*. In Mallarmé's own definition of poetry there is a strong interest in the mystical and the religious, as all poetry is the 'expression … of the mysterious meaning and constitutes the only spiritual task'.[230] He believes in the 'rhythm' of language as a way of codifying or revealing this 'mysterious meaning', similar to the concept of 'analogy' for Cicero's rhetoric or Vitruvius writing on architecture:

> Poetry is the expression, in human language restored to its essential rhythm, of the mysterious meaning of the aspects of existence: in this way, it confers authenticity on our time on earth and constitutes the only spiritual task there is.[231]

In his book *Towards Herodiade*,[232] Alan Rowland Chisholm (1888–1981), Professor of French, describes the path related to religious and philosophical beliefs as well as other poets and movements that led to Mallarmé's poem *Herodiade*.[233]

---

[228] Ibid., p. 34.
[229] 'I use Mallarmé's term advisedly, for it is with Mallarmé, Barthes has said, that our "modernity" begins.' From Richard Howard's preface in Roland Barthes, *S–Z*, trans. Richard Miller (London: Cape, 1975), p. x.
[230] Ibid., p. 80.
[231] Mallarmé provided this definition to the journalist Léo d'Orfer in 1884. Mallarmé, *Selected Letters of Stéphane Mallarmé*, p. 138.
[232] A.R. Chisholm, *Towards Herodiade: A Literary Genealogy* (Melbourne: Melbourne University Press, 1934).
[233] Mallarmé started to write *Herodiade* in 1864 when he was twenty-two. The poem remained unfinished being a testament to the struggle for purity and perfection that is one of its themes. http://www.ncf.edu/hassold/FinDeSiecle/mallarme_herodiade.htm (accessed 25 February 2007)

Chisholm investigates the influence of the Dionysian via Nietzsche,[234] and the Christian element in Romantic poetry, themes that directly influenced the Romantic movement in France as well as the Parnassians and the Symbolists and led Mallarmé 'to postulate the void behind reality'.[235] Within Romanticism lived the relation of poetry to the religious, as for example in a tension between the Dionysian and the Orphic, or related to the individuation of the ego and the self. Later the Parnassians opposed the religious element of Romanticism but mainly as it concerns the formal aspects of poetry, which they tried to examine in a more scientific way. For that reason the Parnassians looked back to antiquity, placing form or structure behind reality. In Mallarmé, God or Dionysus is replaced by the Void, or nothingness. Poetry derives not from God or the Muse, but from the Void, and within the space of the poem is diffracted not the name of God – as manifested in various anagrammatic examples of spatial writing so far, or noted by Baudrillard for the anagram – but nothingness. The Void becomes the religious element of Mallarmé's poetry possibly in the mood of *mal du siècle*, or within an industrial revolution with the rise of other scientific doctrines: a relation that the Parnassians tried to investigate in poetry. In Mallarmé's poetry we witness the longing to be free and liberated, for the mind to travel in an endless sky or wander in a room of thoughts, and he used the form of his poetry as a passage. But behind this mask we do not find any more a divine presence, but nothingness and the void**.**

In this climate of change at the end of the nineteenth century, Mallarmé was fully aware that painting and poetry were inseparable and that a way to bring them together was to create a 'spaced', 'architectural' reading or a poetic space; a space

[234] A.R. Chisholm, *Towards Herodiade,* p. 11.
[235] Ibid., pp. 8–9.

where poetry and painting co-exist, a ‘room’ were both express themselves freely and participate in the creation of the experience of the world.

Space of *Un Coup de Dés*, a Constellation of Meaning

Most of the existing researches on Mallarmé's *Un Coup de Dés* (*A Throw of the Dice*) take as given that it is a spatial structure but they interpret the 'space' as the white of the page and consider how this 'whiteness' is organised and arranged in comparison to the black of the print (fig. 63, 64). For example, according to La Charite, the commentary of the Mitsou Ronat (1980)[236] edition of *Un Coup de Dés* provides a percentage of space, or of how much space exists in the poem:

> 'space' 72% of the text and print 28%
> […]
> There is 2½ times more space than printed text. Quantitavely, space is the predominant structuring component.[237]

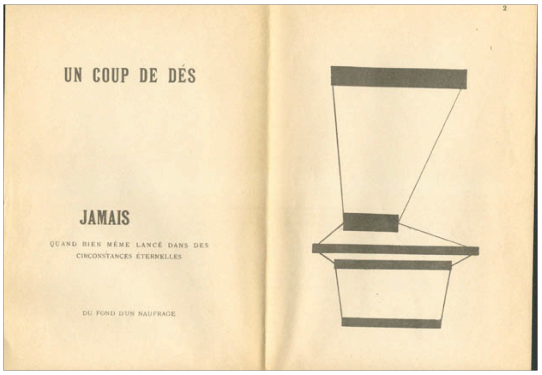


Figure 63 Ernst Fraenkel, analysis of *Un Coup de Dés*. From Johanna Drucker, *The Virtual Codex from Page Space to E-space*, http://www.philobiblon.com/drucker/

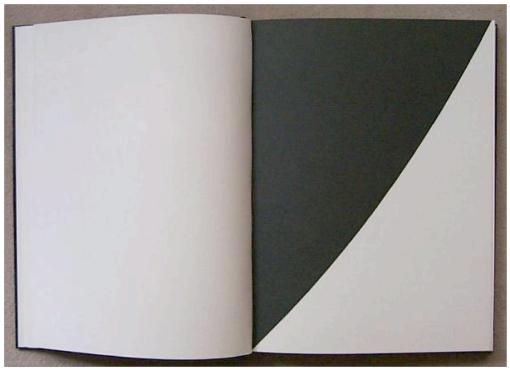


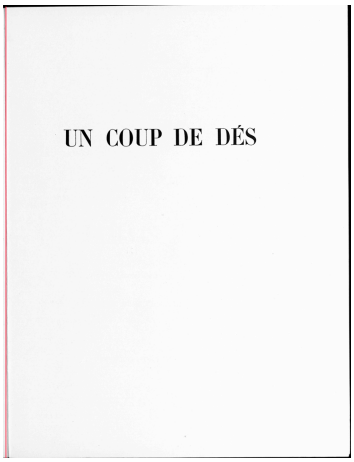
Figure 64 Ellsworth Kelly, interpretation of *Un Coup de Dés.* From http://www.artextbooks.com/images/a17122.html

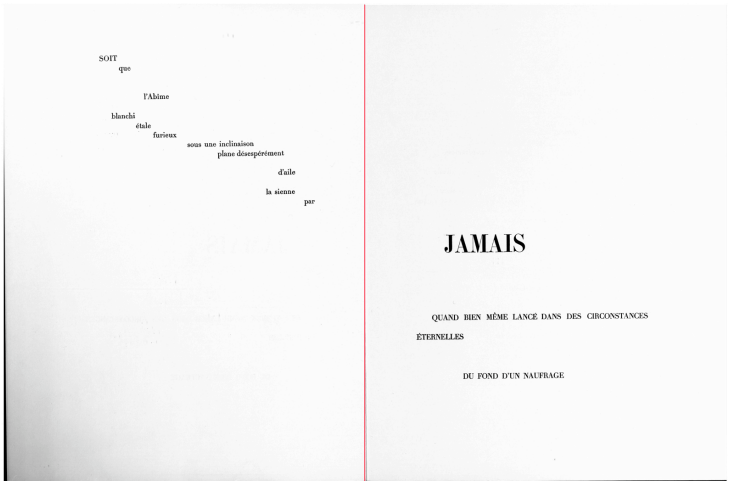
By contrast, I will argue that for Mallarmé space is the 'whole' (book, page, black, white) and the configuration of the 'whole' and is made up of all these elements that create a spatial experience, a 'spaced reading' as he defines it in the introduction of *Un Coup de Dés.* Such experiments on the spatialisation of the text

[236] Mallarmé, *Un Coup de Dés jamais n'abolira le Hasard: Edition Mise En Œuvre Et Presentee Par Mitsou Ronat*, (Paris: D'Atelier, 1980).
[237] La Charite, *The Dynamics of Space,* p. 48.

involve, for example, Florence's work on Mallarmé with both her book and her visual translation (DVD) of the poem. In Florence's work *Un Coup de Dés* is studied within the context of visual arts, and she investigates the active relationship between the word and the image, within the space of the poem as well as within the poem's space. For architecture, it is important to try to investigate this word/image relationship within the space of critical architectural discourse, within what Rendell calls 'architecture-writing', and to look at the possibilities of design that such an analysis could provide. We must examine the space of the poem, as a topological structure, and see possible relations to other architectural spaces.

Mallarmé's approach was detached, to a degree, from content: that is, the meaning as it is conceived in a more conventional way in poetry. The form, apart from its content, becomes the carrier of meaning. It seems that, for Mallarmé, thought and its poetic expression requires form. The experience of this poetic space, based on poetic form, is visual, perceptional and mnemonic in the sense that it creates a mental topography connected to the topology of the book. Language, apart from meaning, becomes a design tool for creating a formal landscape, a space of poetics or a poetics of space. Graphic manipulation is applied consciously to language in order to create space.





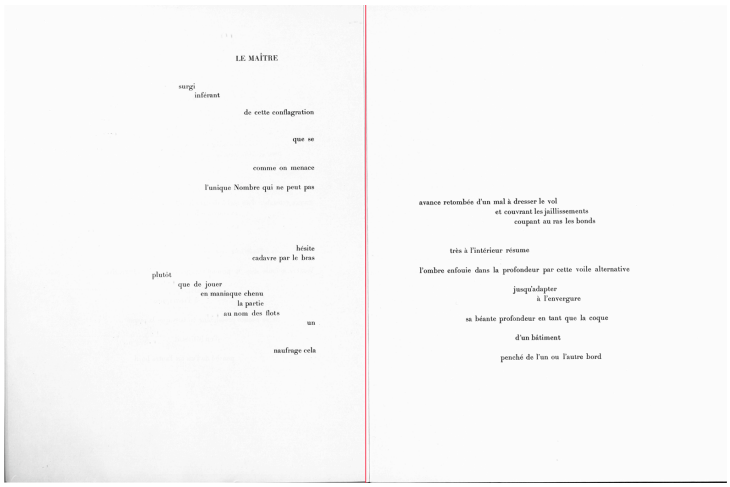


Figure 65 Stéphane Mallarmé, first few pages of *Un Coup de Dés*, note the graphics and arrangement of pages. From *Un Coup de Dés,* Mitsou Ronat edition, Paris, 1980.

In the preface to *Un Coup de Dés*, Mallarmé uses the expression 'spaced reading' and states: 'the paper intervenes each time that an image, of itself, ceases to be or returns, accepting the succession of other'.[238] In his description, the paper itself becomes space, the space of images or of the intervention of images, and 'spaced reading' is the experience of nothingness. 'Spaced reading', according to Mallarmé, is the experience of this space, not the typical procedure of reading but a 'transparent'[239] reading through the pages or beyond the pages, which follows the hidden geometries layered by the poet: for example, poems within poems that follow different fonts, font sizes, numbers and hidden geometries.

The poem is read in multiple ways in multiple times and in multiple layers. When Mallarmé claims that you need 'transparency' to read the book, he means it literally. The reading of the poem demands transparency from line to line, from page to page and from poem to poems within. As David Seaman, literary critic, notes:

> One architectural feature of the book which can be found in *Un Coup de Dés* is symmetry. In his article, '*Crise de vers*' (Verse Crisis) in *Variations sur un sujet* (Variations on a Theme), Mallarmé suggests that in the ideal volume of poetry, 'themes of the same action will be balanced at a distance …'. Further on in the article, he evokes more levels of symmetry, which, in the position of the lines in the work, is connected to the authenticity of the work in the volume, flies beyond the volume … **in a mental space** … The symmetry in *Un Coup de Dés* can be discovered at all levels. The first four words, part of the title, are repeated as the last four words at the end of the poem. This makes a nicely tied up package, though it also suggests a return to the beginning, giving another dimension to the symmetry. This can be tied to the equilibrium of 'mental space' …
> There is symmetry in the structure of the middle page of *Un Coup de Dés* (a page in this work being a two-page spread, *verso* and *recto* considered together). That is page 6, where a text group in the middle, over-lapping the fold, is enclosed by the words 'COMME SI' (AS IF) repeated at the upper left and lower right of the page. They stand out by their large type, and are slightly apart from the main text of the page. This central, symmetrical page 6 is itself

[238] Introduction to Stéphane Mallarmé and Brian Poet Coffey, *Dice Thrown Never Will Annul Chance. A Translation by Brian Coffey, Etc* (Dolmen Press: Dublin, 1965).
[239] 'A reader who reads "transparently", without preconception, as candid as the witness from which that word derives, will perceive these patterns, will understand the connected links which bind together and demonstrate the existence of *l'Idée*.' Roger Pearson, *Unfolding Mallarmé: The Development of a Poetic Art* (Oxford: Clarendon, 1996), p. 3.

> surrounded by two balancing pages. The ideograms (to be discussed more fully later) of pages 5 and 7 are similar. There is symmetry also in the text of the poem, as in the **palindromic** line from page 5: 'the sea by the ancestor attempting or the ancestor against the sea'.[240] [emphasis added]

Symmetry in general, and more particularly palindromic symmetry exactly in the middle of the book, ties this 'mental space' together. Without symmetry Mallarmé's spatial structure would be dispersed and lost. When you read the poem, in a form of déjà vu, symmetry is what holds the two poles together. You read and re-read, experience and recollect the book, the architectural book and the space Mallarmé creates. Symmetry is less visual than experiential through mental processes of memory and recollection, related to the image of the words as well as to their meaning. In a similar way, in architecture, such symmetries make it easier to read a space as you know what to expect at the other side of a building or a structure. Mallarmé treats the book as superimposed pages and images, but what keeps them together is not the binding of the book – which doesn't exist in the edition closer to his specifications – but the symmetry of a mental space. Mallarmé, knowing that the physical space of the book, the page, is two-dimensional, opens up the third dimension of space in memory.

Mallarmé, in his effort to write a book that was 'architectural', appears to have in mind not only more ancient geometrical poetic structures as in the Saturnine Verses but also medieval mnemonic practices. Examining his correspondence with Verlaine concerning his Saturnine Verses, Rosemary Lloyd, Professor of French and Gender Studies, claims:

> The idea of the mind as a room, a chamber, an architectural space, would certainly be familiar to Mallarmé's correspondent [Verlaine], but what seizes the attention is the shift the poet has made. Here the image concerns less the room that represents the mind than a living space furnished with the poet's

[240] David W. Seaman, *Concrete Poetry in France*, *Studies in Fine Arts. The Avant-Garde; No.18* (Ann Arbor: UMI Research, 1981), p. 124.

> thoughts. The allusion seems to be to those **ancient tracts on memory**, where the student creates the image of a vast library in which everything he or she needs to recall is placed on specific shelves.[241] [emphasis added]

In the next part I am going to look further to this idea of Mallarmé's poem as a room of thoughts.

[241] Rosemary Lloyd, *Mallarmé: The Poet and His Circle* (Ithaca, NY: Cornell University Press, 1999), p. 11.

The above quote recalls both the practice of mnemonics and Camillo's *Memory Theatre*, which was a representation in space of the human mind. The page becomes a mnemonic device and the scaffold upon which are built the images to be perceived and experienced by the mind. According to Mallarmé, the 'narrative is avoided' but narrative's geometry plays a significant role. We could go even further to claim that the poem itself becomes the room, a space that we are invited to inhabit: a room designed and first inhabited by Mallarmé out of his thoughts, a room that works as a scaffold for the reader to build onto it his own thoughts and generate an individual spatial experience. Even with his title, Mallarmé suggests the form of the cube for this space with the image of the dice; a room whose randomness of experience (of living) depends on the individual's actions.

Mallarmé was fully aware of the importance of time to achieve his goal, and this is the reason why he decided to fracture time by breaking the narrative's linearity. The title, which is a direct reference to Heraclitus and his very well-known metaphor of time as a child playing dice by the river, suggests also that time is not linear, or maybe the experience of time within this room is not linear.[242] Apart from the game of dice introduced in the title, one of the most important elements of the poem is water in the image of the sea or of whirlpools, and maybe those whirlpools are the passage, the 'corridor', that leads to this room and maybe the wreck Mallarmé describes is that of

[242] Heraclitus used the metaphor of a child playing with dice to visualise the concept of time (introducing the order of randomness in the conception of time). One of his most celebrated fragments states:
'Αιών παίς έστι παίζων, πεσσεύων. Παιδός η βασιλίη'
'Time is a child playing the dice. The kingly power is a child's.'
Κώστας Αξελός, *Ο Ηράκλειτος και η Φιλοσοφία* (Αθήνα: ΕΞΑΝΤΑΣ, 1976).

language itself, suggesting that we have to destroy language, the way we know it and the way we use it, in order to inhabit that room.

In *Un Coup de Dés*, the theme – *Un coup de dés jamais n'abolira le hasard,* (A throw of the dice will never abolish chance) – runs through the text dispersed or dismembered (by having poems within poems) like an anagram, where the name of God is dismembered in a similar way. But there is a basic distinction. In older anagrammatic examples, the theme word that is dispersed within the text is usually the name of God; Mallarmé replaces 'God' with 'nothingness', in the random movement of the dice. French philosopher Jean Paul Sartre (1905–80) observed that Mallarmé 'summons up images which no sooner evoked, collapse back into non-being', 'meaning springs … from a resonant disappearance'.[243] Nothingness, void, or death, is as important as materiality; one does not exist without the other or cannot be defined without the other, and this has to become apparent in the form of the poem and the way nothingness is dealt with. It is through the void that we can see the flickering images of reality.

But if *Un Coup de Dés* is a topological structure – a room of thoughts – how does someone orientate or locate himself or herself within the poem with reference to time, place or people? The time of reading is not linear because of where the words are placed and how. The reader doesn't know how to read the lines, from the left page to the right or within each page, and sometimes has to move to other pages. The placement of lines, words and fonts create uncertainty about what to read first, how to navigate the poem, and how to move within the pages. The time of experience of the

[243] 'Mallarme's poetry shuns inspiration from the concrete world. As spokesman for the realm of Nonexistence, the poet has no solution other than to break with established forms of discourse. Unable to establish complicity with the world or to experience objects in their solid, reassuring neutrality, he summons up images which, no sooner evoked, collapse back into non-being. Meaning springs from "the absence of certain objects", from the "negation of the word's status as a thing", from a "resonant disappearance".' Jean-Paul Sartre, *Mallarmé, or, the Poet of Nothingness* (University Park: Pennsylvania State University Press, 1988), p. 13.

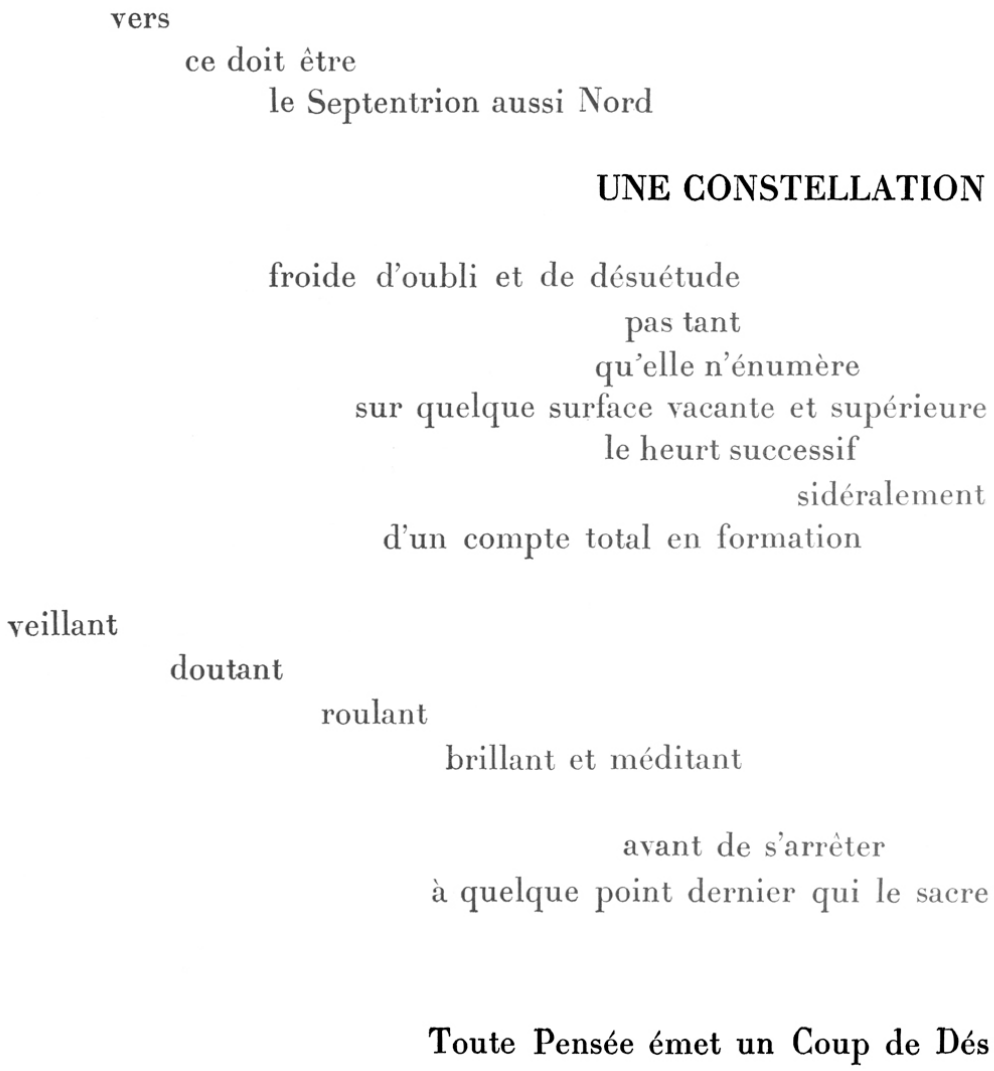
text demands a similarly complicated imaginary reconstruction of the text, a forward/backward movement between the material object, the poem, and the room/space that this object creates in the reader's mind. A constant critical movement between image/perception/memory within the space the poem builds the room of thoughts. The image of the whirlpool within the poem is possibly the one that describes this constant motional and temporal re-placement or re-orientation for both the body and the arts,[244] a movement towards a 'transcendental reality'.[245] But this is a whirlpool that cuts through the pages of the book; the whole book rotates or the pages of the book rotate around a hidden or invisible structure based on numbers, geometry and symmetry. It is like the frame of the fans on which Mallarmé wrote poems: these had the ability to fold/unfold the words upon themselves or upon other words. Similarly, the cylinder poems (mirliton) had to be rotated (like a whirlpool) in order to read the poem. But it also recalls Camillo's *memory wheel*, which was structured around antithetical concepts to create his *whirlpool of artifice*, where the argument was experienced in the centre of this space, the eye of the whirlpool. In *Un Coup de Dés* the structure is hidden and the frame is invisible (in comparison to the fans and the mirliton); words are 'flickering' through the void, and what holds them together is symmetry, the invisible force that creates this 'galaxy of signifiers'. This seems to perfectly correspond to Barthes' definition of the 'ideal plural text':

---

[244] 'The ideogram on Page 6 represents art expressed as a whirlpool ("tourbillon", in the middle of the page), for art returns upon itself and nature, creating an eddy of its own, a momentary stasis, yet not, which paradox is figured as a spiral, that of artistic production as well as the history of art...' Robert Greer Cohn, 'Mallarmé's Un Coup de Dés: An Exegesis. [a Thesis. With a Facsimile of the Paris, 1914, Edition of Un Coup de Des jamais n'abolira le Hasard]' (New Haven, 1949), p. 31.

[245] '[O]rientation is the ability to locate oneself in one's environment with reference to time, place, and people. In this respect, Katz speaks of shocking, even shuttering, the standard epistemic security of disciples, and forcing them to *locate* themselves [reorientate] vis-à-vis normal versus transcendental reality.' Reuven Tsur, *On the Shore of Nothingness: Space, Rhythm, and Semantic Structure in Religious Poetry and Its Mystic-Secular Counterpart: A Study in Cognitive Poetics* (Thorverton: Imprint Academic, 2003), p. 208.

In the ideal plural text the networks are many and interact, without any of them being able to surpass the rest; this text is a galaxy of signifiers, not a structure of signifiers; we gain access to it by several entrances, none of which can be authoritatively declared to be the main one; the codes it mobilizes extend *as far as the eye can reach*, they are indeterminable (meaning here is never subject to a principle of determination, unless by throwing dice); the systems of meaning can take over this absolutely plural text, but their number is never closed, based as it is on the infinity of language.[246]


vers
ce doit être
le Septentrion aussi Nord

UNE CONSTELLATION

froide d'oubli et de désuétude
pas tant
qu'elle n'énumère
sur quelque surface vacante et supérieure
le heurt successif
sidéralement
d'un compte total en formation

veillant
doutant
roulant
brillant et méditant

avant de s'arrêter
à quelque point dernier qui le sacre

Toute Pensée émet un Coup de Dés

Figure 66 Stéphane Mallarmé, detail of last page, emphasis added. From *Un Coup de Dés,* Mitsou Ronat edition, Paris, 1980.

[246] Roland Barthes, Richard Miller and Honoré de Balzac, *S–Z* (London: Cape, 1975), p.5.

Mallarmé himself uses the word *constellation* (fig. 66) within *Un Coup de Dés* and he creates a poem without a beginning or an end, giving it the form of a whirlpool; there are 'several entrances'; it is not bound, and it can be read from left to right or the opposite and 'transparently' behind the pages, *as far as the eye can see.* It is reversible as the poem flips over in the middle by using the palindromic symmetry (COMME SI / COMME SI) and moves between reality and memory. The meaning of the plural text according to Barthes is 'determined by the throwing dice', and for Mallarmé 'A throw of the dice will annul chance'; by this, he claims that randomness will determine meaning, as meaning is as random as our re-placement, re-orientation within a spatial structure, a room or a room of our thoughts. Mallarmé seems to be aware of the danger of his poem – plural text – to disperse meaning within the 'galaxy of signifiers' it creates – moving infinitely outwards or collapsing to a centre – and symmetry is used to keep together the elements of this space, this 'universe', a galaxy of *constellations*. Such an operation of symmetry and palindromes within *Un Coup de Dés* recalls other examples analysed so far, like the double-headed eagle, or Vitruvius' *Ten Books on Architecture*.

A method Mallarmé uses for the reification of *Un Coup de Dés* is the 'destruction of illusion', which according to literary critics Jeffrey Smitten and Ann Daghistany means 'that the reader is forcibly reminded of the textuality of the book'.[247] By creating a highly structural and visual arrangement of letters, words and meanings, Mallarmé reminds the reader constantly that the text is just a text, a material object. When we read a text we have the tendency to identify with its contents, its meanings or its characters and their actions, forgetting that above anything else reading is a physical action. When reading *Un Coup de Dés* you are

[247] Jeffrey R. Smitten and Ann Daghistany, *Spatial Form in Narrative* (Ithaca, London: Cornell University Press, 1981), p. 23.

forced to constantly forget and simultaneously remember that above anything else you are holding a book, a process which contributes to the constant movement between image and memory, what you see and what you believe you see. This is achieved by making a visual poem that moves between poetry, painting or graphic design.

The act of reading becomes a bodily experience and the book transforms into a performative space that can be experienced by the body.[248] Mallarmé considered himself not as an author but as an operator, which is evident in the image of the captain, who although being in command of the ship or poem has not control over its operations, as the captain has to guide the ship through a hazardous sea. *Un Coup de Dés* was an experiment towards Mallarmé's most ambitious plan to write *Le Livre*, 'the philosopher's stone of all books', and 'an Orphic explanation of the world'. He was planning to make two versions as 'printed volumes for the public' and 'performances for an élite'. A description of how *Le Livre* was going to operate is given by literary critic Dee Reynolds:

> Thirty loose pages would be placed in six drawers of a lacquered cabinet, forming a diagonal line, five pages in each drawer. As master of ceremonies Mallarmé could control the combinations, but he did not wish to be responsible for the meaning of the Book or to be known as the author, but envisaged himself as the 'premier lecteur'.

Mallarmé used to say about *Le Livre*; 'tout, au monde, existe pour aboutir à un livre' (everything in the world exists in order to end up in a book) with regard to its performative character and to theatre. This recalls Camillo's mnemonic theatre, a theatre that was designed in order to contain all the knowledge of the world. Camillo's large-scale mnemonic device comprised drawers in which was placed or codified all the information, not unlike *Le Livre*. *Le Livre* 'would create itself through

[248] 'In fact Mallarme's fascination with theatre and performance led him to move beyond the boundaries of the written text … Writing for Mallarmé, is choreographical, just as dance is writing with the body (MOC, p. 307).' Dee Reynolds, *Symbolist Aesthetics and Early Abstract Art: Sites of Imaginary Space* (Cambridge: Cambridge University Press, 1995), p. 207.

its structure, whose "confrontations" or symmetries could give rise to new entities … In this way, the *Livre* generates its own operator', in similar way to Perec's self-generated book, *Life A User's Manual*, where the author sets up the mechanism of the book and then becomes the spectator of its construction. Once more symmetry is the basic element of space that both keeps the book together and creates 'new entities', new structures, in a constant movement between reality and the imaginary. According to Reynolds:

> Rhythmic connections between textual/pictorial and imaginary space enable texts and pictures to be experienced as **sites** of harmonious interaction between sensory reality and imagining activity. At the same time, the complete integration of the medium and imagining activity remains an unrealizable goal, as does the universalization of this rhythmic relationship between consciousness and the sensory environment. Textual/pictorial spaces function as sites of 'negative presentation' whose utopian implications extend beyond the sphere of arts itself … new insights are derived from sensory and material structures rather than from abstract and conceptual thought.[249] [emphasis added]

Mallarmé's *Livre* was never realised but *Un Coup de Dés* is considered to be the closest example we have to this project. According to Peter Quennell (1905–93), literary historian, poet and critic, the *Livre* consists of another book/poem that was planned and arranged in a way to 'build itself':

> For when he [Mallarmé] wrote, it was methodically; he constructed a skeleton, significant words deliberately scattered over his maiden sheet, prearranged schemes of rhyme … and within these limits the poem had only to build itself![250]

The result is concrete because the poem itself is an inhabitable structure, a room of thoughts, whose geometry is equally important to its meaning. It is a geometry of the image as well as a geometry of language and a geometry of memory in order to perceive and extract the meaning of the poem. For example, in order to

[249] Ibid., p. 215.
[250] Peter Quennell, *Baudelaire and the Symbolists* (London: Shenval Press, 1954), p.154.

extract the meaning of the main title *Un Coup de Dés*, the reader has to look or read in many different pages as meaning resides also in the experience of form.

Cancellation of Meaning in *Un Coup de Dés*

> Chance doesn't enter into any line and that is the great thing. Several of us have achieved this, and I believe that when lines are so perfectly delimited, what we should aim for above all, in a poem, is that the words – which are already sufficiently individual not to receive external impressions – *reflect upon each other to the point of appearing not to have their own color anymore, but to be merely transitions within an entire gamut*. Although there is no space between them, and although they touch each other wonderfully, I feel that sometimes *your words live a little too much as individuals, like the stones in a mosaic of jewels*.[251]

Commenting on Francois Coppee's (1842–1908) poetry in a letter in December 1866, Mallarmé not only describes how words may operate spatially as material objects but also gives an interpretation of his main theme, 'A Throwing of the Dice will Never Annul Chance' in *Un Coup de Dés*. Mallarmé says that Chance, the Dice itself, or a throwing of the Dice will Annul Chance; that the Dice or language itself as a material object has the ability to cancel itself, in a self-reflective, self-referential or narcissistic motion. The Chance of the poem itself as a material object will be cancelled, by its own nature, by the Chance in the action of reading, in a constant reversible movement between reality and thought, object and interpretation. The random motion of the Dice reflects the random motion of thought within a solid structure, in this case the poem itself and vice versa. Although within a poem Chance should not 'enter into any line and that is a great thing', thought should be free to fly in numerous and seemingly random combinations and routes, so meaning can be grasped only retrospectively.

In *Un Coup de Dés* words seem to be scattered randomly within the page like the stars in the sky, like a *constellation*, but as the poet himself claims, they follow a very specific pattern/structure. It is our perception and the movement of our thought

[251] Stéphane Mallarmé, *Selected Letters of Stéphane Mallarmé*, ed. Rosemary Lloyd, trans. Rosemary Lloyd (Chicago, London: University of Chicago Press, 1988), p. 69.

within this structure that creates the infinite combinations, just like the patterns we create to read the stars in the sky, the constellations.

In another letter sent to Henri Cazalis in January 1864, Mallarmé gives a description of how his poem *L'Azur* was structured:

> I swear to you that there is not a single word which hasn't cost me several hours of research, and the first word which contains the first idea, not only helps to create the general *effect* of the poem, but also serves to prepare the last word … the *effect produced,* without a dissonance, without a fioritura, even an adorable one, for that distracts – this is what I am seeking … There now remains the other side that has to be considered, the aesthetic side. Is it beautiful? Does it contain a reflection of the Beautiful? ... It's a long way from these theories of composition to the way in which our glorious Emmanuel takes a handful of stars from the Milky Way to scatter them over the paper and lets them form unforeseen constellations at random![252]

In a similar way, the choice of the main theme – a throwing of the dice will never annul chance – in *Un Coup de Dés* and its scattering within the structure of the poem was made to signify both the beginning and the end of the poem and the 'unforeseen constellations at random'. In the above extract there is a seeming contradiction that, although nothing is random, the *Beautiful* reflects a form that resembles the randomness of the stars; a paradox upon which the whole poem is structured and that provides it with its main theme, allowing readers to grasp only fragments or reflections of the *Beautiful*, which is dismembered within the poem, like Orpheus' body. For Mallarmé, the structure of language resembles that of the Universe and the order of words within the poem that of the Milky Way and the stars. We as humans perceive reality – either that of the stars or that of language – in a similar way because of our own structure, our own body.

In *Un Coup de Dés*, the mirror that creates the whole effect of the poem is placed exactly in the middle, as Mallarmé uses palindromic symmetry. Here, every controversy, every reflection and cancellation occurs. As in Mallarmé's poem *L'Azur*,

[252] Ibid., p. 26.

where the title includes the main theme of a mental 'flight before the possessive sky', in *Un Coup de Dés* the very same action of randomness will cancel itself; what appears as a random constellation or as obscure – and Mallarmé has been very often accused of obscurity and incomprehensibility – has a strict order and a transparent clarity which reflects its beauty onto the reader in a narcissistic motion, in memory or in the structure of readers' minds whether being perceived as obscure, mystical, random, ordered or beautiful. The invisible or the void fills the distance in between the space of the page and the space of our mind. This is an invisible space of experience hidden within the geometry of a structure, in this case of the poem. Mallarmé agreed with the comment of poet, author and critic Edmund Gosse (1849–1928) about his poetry:

> His aim [Mallarmé] … is to use words in such harmonious combination as will suggest to the reader a mood or condition *which is not mentioned in the text*, but is nevertheless paramount in the poet's mind at the moment of composition.[253]

A very similar idea has already been analysed in Valéry's *Eupalinos or the Architect*, in connection not with a poem but with a building. In a similar way to the above description of poetry, Valéry suggests that the architect managed to transfer to a temple, with the help of geometry, an erotic experience. Both Valéry and Mallarmé are looking to find the relation between structure and experience, and in both cases they use the example of how music operates. Valéry claims that only architecture and music have the ability to transfer emotion through their structure, and Mallarmé states:

[253] Ibid., p. 190.

> I create Music and give that name not to the music one can extract by the euphonious juxtaposition of words, this primary condition is self evident; but the beyond, which is magically produced by certain dispositions of the word … I use Music in the Greek sense, meaning basically, Idea or the rhythm between connections.[254]

Mallarmé's *Un Coup de Dés* attempts to investigate the relation of poetry, music and painting, which is in accordance with the Dionysian ideal and possibly also reflects the influence of the ideas of Wagner – whom both Valéry and Mallarmé admired – about *fusion of the arts*.

The poem, object or Dice in the form of language will cancel (Annul) the interpretation of the object itself, a movement between the real and the ideal, structure of the object and structure of our thought. In between those two, the real and the ideal, exists the void or nothingness, 'although there is no space between them', as Mallarmé himself claims, and we can perceive only the reflections of those words through the void, their shadows as objects in 'transition' ('words … reflect upon each … merely transitions within an entire gamut') or, as Barthes describes, 'flickering signifiers'. In this sense, space is defined as a constant movement within the void, a reflective process between the real and ideal or between things and thought or, by the action of reading the poem, the interpenetration of those two.

By placing the palindromic symmetry in the middle of the poem, Mallarmé places the 'mirror' of creation. It is a narcissistic act of creation of the Universe and the World that he creates. The words COMME SI … COMME SI play the part of the double mirror of the poem, the shadow of the shadow of the universe in the *eye* of the *whirlpool*. Exactly as Narcissus is being consumed by his own image and the image of his image, the consumption of the image – of the image of the image of the poem – becomes within *Un Coup de Dés* an act of creation, the reflection of a reflection as

[254] Ibid.

everything merges in a synthetic, Dionysian night, where the individual loses its shape, form, in a double motion that brings life and creates the universe. The reader is the captain of the shipwreck which is the language, destroyed and created like the Narcissus and his image.

For this narcissistic notion is an integral part of the Romantic idea. According to Chisholm, in the writings of romantic poets 'the statues of the Greek gods nearly always stand by a pool, in which they are mirrored',[255] possibly for a reason similar to why we see palindromes next to fountains. 'Classical poetry sought to take objects *out* of time and put them into *space*; they were not to become visible as reflections of an inner mirror, but were to lead an independent, plastic existence, blessed in itself … But the soul of Romanticism is the inner mirroring, the reflection which lifts [things] out of space into time, time being closely associated with subjective nostalgia.' Mallarmé takes the idea even further, placing this self-reflective mirror in the heart of his poem and not in a place outside its own formal structure, where the poem reflects itself and the reader. Another difference is that, instead of the image of a Greek god, the image of the object, the self and the Void is reflected.

According to Baudrillard, within the anagram is dismembered the body of Christ or God, a process based on the non-linear relation of the signifier/signified. In *Un Coup de Dés* the Void is dismembered in a similar way; it is not described or explained by the use of words but contained within their structure and the structure they support, the poem itself. The narcissistic character of the poem, apart from the form of the poem, is apparent in the symbols Mallarmé uses, such as those of the whirlpool, the constellation of stars, the shipwreck and the night. [256]

[255] Chisholm, *Towards Herodiade: A Literary Genealogy*, p. 135.
[256] 'With Mallarmé we witness the phenomenon of pure Narcissism, which, gnawing at its own vitals, is continually destroying itself.' Ibid., p. 192.

According to Mallarmé's speech given in Oxford, *La Musique et les Lettres* taken from his biography by Grant Gilmore (1910–82):

> What there remains as the artist's function? To seize the connections between objects: 'equal to the act of creation: the idea of an object, disappearing, which is lacking … Such an occupation suffices, 'comparing aspects and number, as they touch our negligence; awaking there as décor, the ambiguity of a few lovely figures at the intersections. The whole an arabesque …'[257]

For Mallarmé, the creation of meaning is based on the 'ambiguity of a few figures at intersections', and the main duty of the artist is to 'seize' exactly these connections between objects' – in other words, to handle the invisible element of poetry by handling the links and distance between objects, words, pages or concepts. In addition to Gilmore, Heather Williams in her essay *Mallarmé and the Language of Ideas* notes also the importance of connections between words: 'words alone can collapse into a mosaic of sounds, the links between them do not'.[258]

More generally, the connections or links between the elements of a sequence in linear or more dimensional structures is what generates the process of making meaning. When handling any text, the reader has to move through its letters which, when combined, create words, and then has to move through the words which, combined, create pages and, in their turn, books. This motion activates memory and imagination by creating connections between images, concepts and thoughts, and generates meaning. But also the links themselves in their nature or structure hide part of the creation of meaning and the experience of space or each space created. These links could be claimed to consist of empty space, as void or nothingness between the

---

[257] Grant Gilmore, 'Stéphane Mallarmé: A Biography and an Interpretation' (PhD Thesis, Yale University, 1936), p. 174.

[258] 'Mallarmé's discovery is that words themselves are not enough, and that in order to really say something it is the connections between them that must be used; words alone can collapse into a mosaic of sounds, the links between them do not.' Heather Williams, 'Mallarmé and the Language of Ideas', *Nineteenth Century French Studies* 29, no. 3&4 (2001). http://muse.jhu.edu/journals/nineteenth_century_french_studies/v029/29.3williams.html (accessed 10 October 2008).

elements of a sequence, but although we perceive them as nothingness, it doesn't mean that they don't exist or that they are empty. The reader may not be able to perceive the links as with the actual words or concepts, but they have their own values and characteristics. Some of their characteristics are distance, direction and the ability to be charged and transfer geometric characteristics.

Keeping in mind the context of Mallarmé and *Un Coup de Dés* and how geometry, distance and symmetry operate in the process of creation of meaning, the next section will focus on a more detailed analysis of the actual poem, the way it is structured and how it creates meaning.

Black and White in *Un Coup de Dés*

In a letter to Cazalis, Mallarmé, describing his sonnet *Ses Pur Ongles*, gives a definition of how he is using the *Word* in his poem and possibly of the use and balance between black and white in the pages of *Un Coup de Dés*:

> I'm extracting this sonnet, which I thought about once this summer, from a projected study on The Word; it is inverted, by which I mean that its meaning, if there is one (but I'd draw consolation for its lack of meaning from the dose of poetry it contains, at least in my view), is evoked by an internal mirage created by the words themselves. If you murmur it to yourself a couple of times, you get a fairly cabbalistic sensation.
> That amounts to a confession that it is not very 'plastic' as you request, but at least it's as **black and white** as possible and it seems to me to lend itself to an etching full of the Dream and the Void.[259] [emphasis added]

In the above passage Mallarmé seems fully aware of the word's ability to evoke experience and the transition from the geometric image of language to the inner image, mirage, of a mental landscape, a transcendental experience similar to the meditative practices of the medieval scholars. He acknowledges a double movement: first the movement from the materiality of the object to its meaning, but also at the same exact time a second 'inverted' movement that is evoked by an internal image, a 'mirage' of multiple signifiers that are as unstable and flickering as the stars. This 'inverted' movement is what creates a universe of experience affecting the material world, the reality. An 'etching' full of 'black and white' or the 'Dream and the Void', night and light, synthetic and analytical, Dionysian and Apollonian, that merges and separates. This idea of 'black and white' may not have been expressed in a plastic way in *Ses pur ongles*[260] but gains its full plasticity in *Un Coup de Dés*, where the meaning of the words, their structure and the structure of the poem itself are

[259] Mallarmé, *Selected Letters of Stéphane Mallarmé*, pp. 86–87.
[260] In *Ses pur ongles*, according to Mallarmé, night or white is represented in the poem by 'a night made of absence and questioning' and light by 'a warlike and dying frame of a mirror … with its reflection of Ursa Major, which links to heaven alone this dwelling abandoned by the world.' Ibid., p. 87.

constantly balancing between Black and White, image and its inversion, and the poem becomes an *etching*. The space of the poem is somewhere in between, in constant flux, created and destroyed by this anti-thesis.

UN COUP DE DÉS … JAMAIS … N' ABOLIRA … LE HASARD
A CAST OF DICE … NEVER … CAN ANNUL … CHANCE

The main theme, above, of *Un Coup de Dés* is being dispersed not only within the space of the page but within the space of the whole book (in pages 3, 5, 11, 19).[261] It is a process of the mind that draws the lines of association between objects/words and ideas; a process that opens a field of spatial experience where meaning is being created.

In this process, the mind stands between the real and the ideal, matter and its cancellation, otherwise between the word, the page, the book and their elimination, in order to create the associations of meaning, 'transparent reading' as Mallarmé calls it. Consequently, reading is a continuous process of creation and destruction. Every pair of associations created by the reader is being instantly destroyed by the intervention of a new one, the 'intervention of other images', and this is a continuous process. Although it sounds like a contradiction, this is possibly how the time of the poem is being reversed and cancelled; it is a continuous and at the same time instantaneous process, because when a meaning occurs it is always being instantly destroyed or altered by the intervention of a new one, or a process of instances that are always happening, creating a text in a constant flux or at a state of becoming. In this way, the poem operates like Camillo's whirlpool of artifice, his memory wheel where experience occurs in the middle of the whirlpool, the space created by antithetical concepts.

[261] Mallarmé intentionally didn't use page numbers but we are going to use numbers here for the sake of our analysis.

With the above process, the main theme – UN COUP DE DÉS … JAMAIS … N' ABOLIRA … LE HASARD – starts to merge with the other secondary themes of the poem, both as material images (words) and as images of the mind. The main theme's letters, words, fonts, typefaces start to mix up with other words and other typefaces, with bold letters and italics, in the same and other pages, in the plane of the page or within the book's three dimensions, and all of them become a visual constellation. But at the same time the image of throwing the dice merges with that of the captain who guides his ship through the storm in the eye of the whirlpool; the master who loses control over reality but holds in his hand his last chance, which is all the infinite chances together – or at least as many as two dice have to offer – or as many as the stars in the sky. All themes of the poem can work separately or together, depending on our intentions, our observations and our memory.

The distance between themes or the gap between images is being occupied by the void, the centre of the whirlpool, the cancellation of matter either as the materiality of the page and the book or that of reality, which surrounds us. Poetry takes us to a place where concrete reality is being shattered, is out of balance; a place where chance is creating new possibilities, new combinations, and new life is being formed and again destroyed at the same time. A new reality.

EVEN THOUGH INDEED CAST IN CIRCUMSTANCES OF ETERNITY FROM A WRECK'S DEPTHS

BE

THE MASTER

AS THOUGH … AS THOUGH
IT WAS THE NUMBER … IT WOULD BE

MIGHT BE MIGHT IT COMMENCE AND CEASE
MIGHT IT BE CODED
MIGHT IT ILLUME

NOUGHT
WILL HAVE TAKEN PLACE
BUT THE PLACE

EXCEPT
PERHAPS
A CONSTELLATION

Figure 67 A poem within the poem of *Un Coup de Dés.* Produced by author.

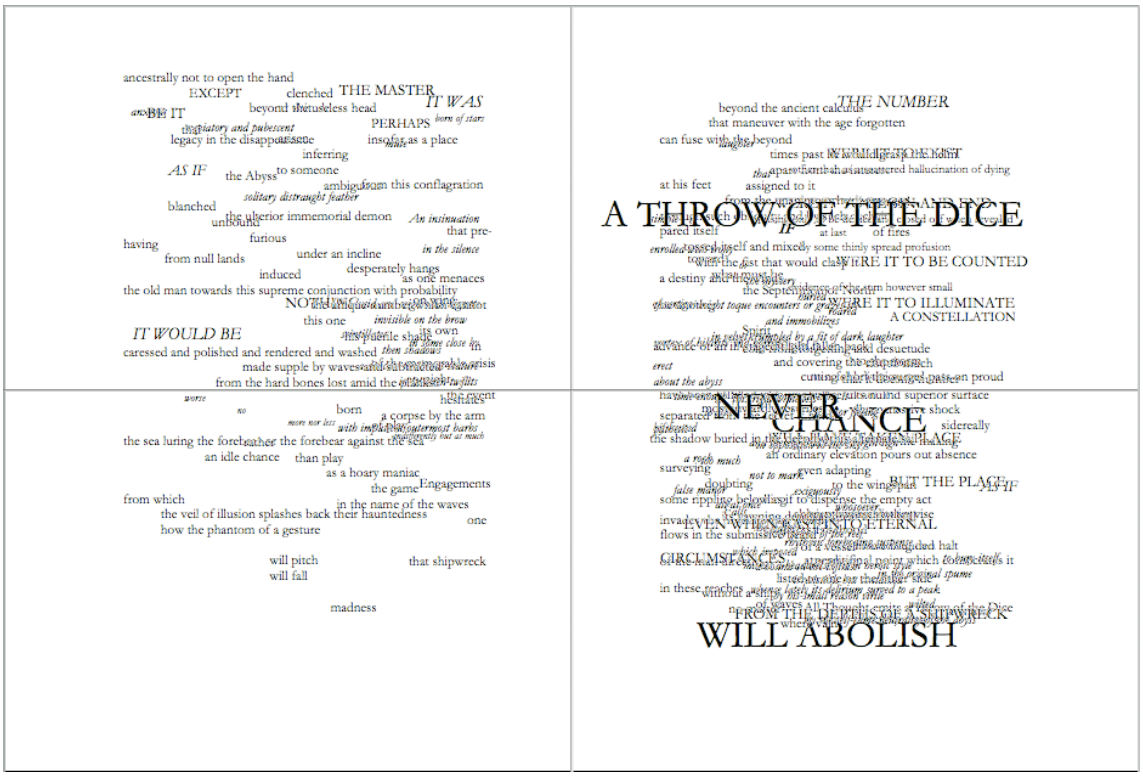


Figure 68 A drawn representation of a 'transparent' reading. All of the pages of UCDD are superimposed. Produced by author.

Let's examine how these associations of meaning and images, and the movement between them, operate in a poem such as *Un Coup de Dés.* I will use an example directly from the poem but I will try to create a simpler one, with far less complicated images, which I believe works in a similar way, showing how the syntax is being broken down.

RED

tree carries a fruit,

myth of the …

APPLE

These few words could be read as RED APPLE if we follow the bold large font, which is a very simple, clear image familiar to all of us; or by following the smaller fonts, we get a 'tree carries a fruit' – another familiar image. If we decide not to pay attention to the different font sizes it could be red as 'red tree carries a fruit, apple' where the tree is red, possibly reflecting a sunset that filters the colours, or as 'red apple, tree carries a fruit'. With the intervention of italics, it could be read as 'RED *myth* of the APPLE' – this phrase in smaller italics like a whisper – which gives again a different image of a red myth, possibly relating to the myth of creation, the original sin and the cycle of life and death. Or it could be read that the 'tree carries the myth', most likely that of the APPLE or again of creation, but relating more to nature, as the image of the tree holds now the key to the myth and not Eve, or many other interpretations, according to how we want to relate the words and meanings. Creation of meaning becomes a process of movement on the plane of the page, in our mind and between those two; the combinations are far more various and definitely more free and open than using a linear phrase – instead of the two-dimensional movement –

with the same words. For example, in the case of 'tree carries a red apple, which relates to the myth', we have not much choice: there is one movement, one perception, one interpretation, which is definitely not reversible as in the palindrome.

We can draw these lines of associations and examine such examples to see how Mallarmé used graphical associations, mirrored symmetries, chiasmus, drawn lines, measured pages and fonts, calculated analogies, and in general handled his drafts and texts as drawings.

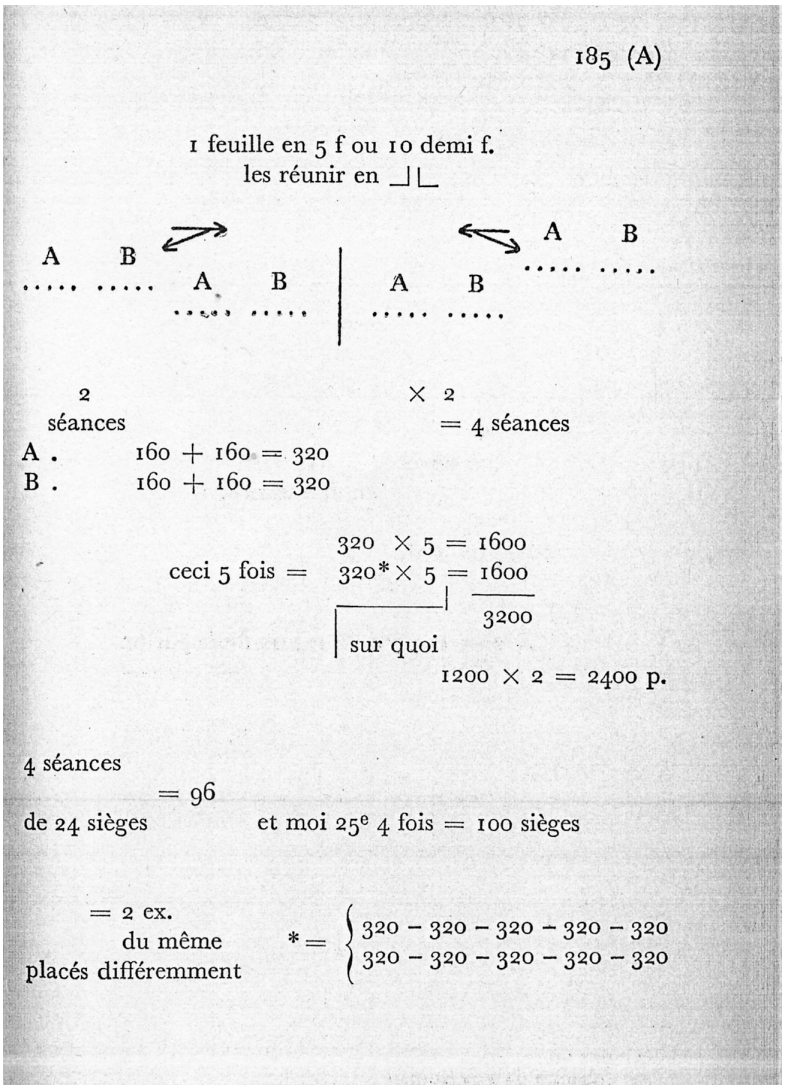


Figure 69 Stéphane Mallarmé, notes for the *Livre.* From *Le Livre*, ed. by Jacques Scherer, Paris, 1957.

One ability of the mind is that of imagining spatially, or what possibly could be called 'spatial imagination'.[262] Such graphical associations trigger mental functions in the imagination of space. When the reader, artist or architect imagines space, or imagines spatially, by the intervention of a text or drawing, such lines behave as forces of association that keep this space together, something that we have observed also in the use of anagrams in architectural mnemonics. These forces keep our thoughts together so they don't disperse, recalling the book or travelling within its pages – architectural mnemonics – or they operate as the force of gravity between two objects, transfer the weight, bridge two columns or windows, create an arch or a dome. A similar arch, link or line between two words–concepts is illustrated in the following conceptual drawing:

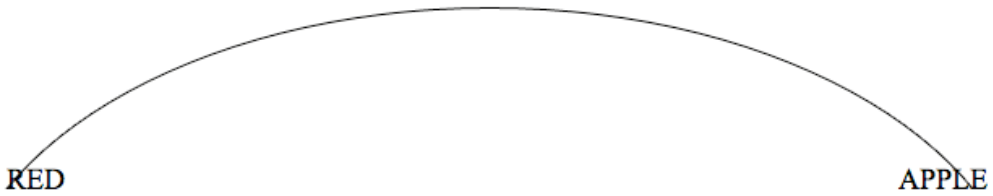


Figure 70 Lines of association. Produced by author.

Such lines of association were employed by both literature and architecture in the Renaissance and were related to the invention of perspective representation: they used to be called *linee occùlte*. The first to use this term was architect and theoretician Sebastiano Serlio (1475–c. 1554). According to Saiber:

> Serlio, the sixteenth-century architect, used the term *linee occùlte* in his 1584 work, *On Architecture*, to describe the unmarked or partly marked axes, edges, and coordinates of architecture. These invisible or semi-visible lines were used as a practical guide in the formation of geometric plans, a sort of imagined scaffolding that served as a continuous invisible network to define the spaces in an architectural drawing. In proper Neoplatonic fashion, Serlio's *linee*

[262] For more information on the term 'spatial imagination', look at the homonymous 'cross-sector and multi-disciplinary research cluster' organised at the Bartlett School of Architecture, directed by Jane Rendell: http://www.bartlett.ucl.ac.uk/otherhostedsites/spatialimagination/index.html (accessed 12 March 2008).

> *occùlte* represented the 'secret' connections between separate geometric elements. In book II of his work, we see that Serlio conceived of these lines as resembling those *influssi* that linked different Platonic worlds. They were, essentially, 'lines of influence', like Bruno's concept of *vinculi*, developed in his works on natural magic. Invisible lines, *linee occùlte*, and *vinculi* are implicit in a line of text, the function of which is to connect words to ideas and meaning. Similarly, rhetorical figures of accumulation are rigorous enforcers of this function, stringing together words or phrases into a linear structure, with the aim of influencing or persuading the reader to follow a particularly exaggerated line of thought.[263]

Linee occùlte directly relate text to architecture and the formation of an argument or a narrative to geometry. On such invisible scaffolds, created by such *linee occùlte*, books were spatially translated and stored in someone's memory, in mnemonics. Perspective drawings are based on such a scaffold of invisible lines, *linee occùlte,* which guiding the eye behind the surface of the page open up perception and memory to the illusion of spatial experience. The function of those lines was to connect 'words to ideas and meanings',[264] in texts, drawings or buildings. It is like a comment that behind the obvious is hidden exactly the above connection, a manifestation of the non-linear sign/signifier immediate relation. These are the lines that connect and relate the sign to its multiple signifiers in non-linear structures, linguistic or architectural.

Without this arch of association – between the words 'red' and 'apple' described above – these two words, concepts and ideas would remain in their distinct realms, the two edges of the page. What bridges them is this connecting line of ideas, a *linea occùlta*, a line that creates the recollection of the experience of a RED APPLE, the texture, the colour, the smell, the taste, the myth of the creation and the Paradise, in a space of poetry or poetic space. Between these lines, other lines intervene, other associations, opening the field of the space of poetry kept together by our spatial

[263] Saiber, *Giordano Bruno and the Geometry of Language*, p. 76.
[264] Ibid.

imagination, like the image of a constellation, a pattern that we create, or like a thought and an afterthought. The poet is the operator of this machine within the space of the book and our mind.

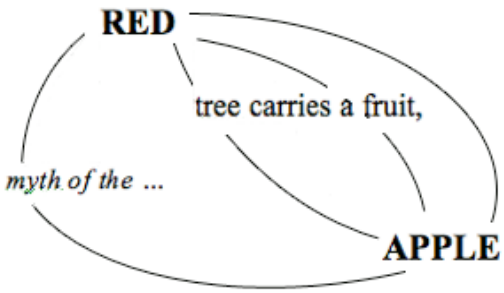


Figure 71 Lines of associations – the arches – between concepts. Produced by author.

Between the gap or the void of two objects/concepts created or bridged by such lines it is possible to hide another concept or idea, another experience, as with the name of God in the anagram. Mallarmé extends these lines behind or over the page, in a third dimension, and within the forces of the void, or the whirlpool, he places other thoughts, ideas, images. It could be somehow considered a process equivalent to the invention of perspective in painting where imagination opens up a field of associations behind the plane of the paper, although there is nothing but the void there; a space where *linee occùlte* are driving the eye, but which at the end are erased, like a scaffold upon which the architect builds and which at the end is removed.

With this gesture, in *Un Coup de Dés*, Mallarmé goes even further than the example of the 'red apple'; the text moves back and forth and behind the pages, creating an even greater degree of complexity in reading and consequently in the perception of time–space and the formation of meaning. As observed at the axonometric representation of the poem, (fig. 72) the reader's eyes and mind have to

move along lines, on the plane and in a cube, which is the book itself or the dice, as the main theme of the poem suggests. The book becomes the dice, and reading depends on the order of chance and becomes a gesture, ‘a throw of the dice’. Possibilities are almost infinite. In this sense, roles change, and the reader instead of the poet becomes the ‘master’ and holds the dice in his or her hands. The ship is the poem itself, the vessel to explore this space. The poet, as the one who sets the mechanisms of the book, is the operator, which is the role Mallarmé envisioned for himself in *Le Livre*.

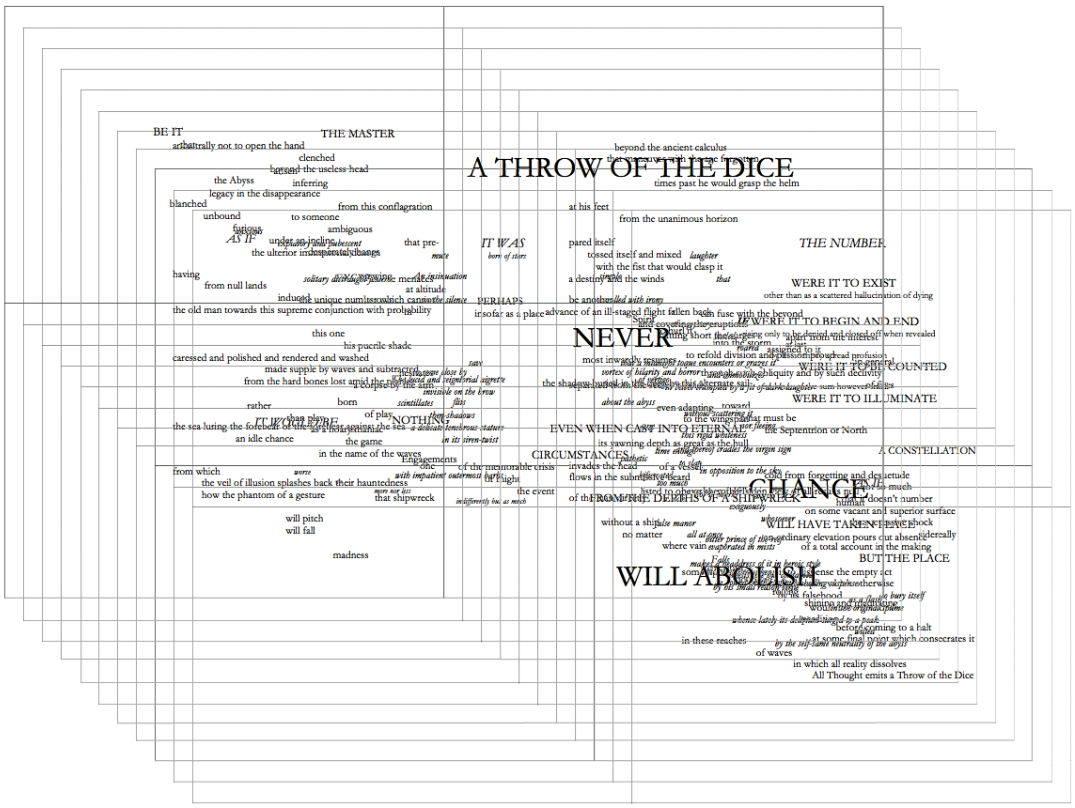


Figure 72 Axonometric drawing of *Un Coup de Dés*. Produced by author.

The above analysis recalls also the ancient Greek comic poets’ cubic poetry, referenced in Vitruvius, and the Pythagorean practice of writing, where the text was structured following geometrical laws. In Cesariano’s translation of Vitruvius’ *Ten*

Books of Architecture, in the passage about the relation between writing and architecture, the image of the Pythagorean literary cube (analysed in the previous chapter) is accompanied by the images of dice (fig. 34). According to Vitruvius, when the text follows the law of cubic poetry it has a double function in the theatrical play; on the one hand to create 'immovable stability of memory', or to remember the words, and on the other to 'relieve the actors' speeches with these intervals', break up the linearity of the play with intervals of memorable poetry, contributing to the action's space.[265] It is hard to establish a direct link, a *linea occùlta*, between Mallarmé, Vitruvius and Pythagorean theory, but Mallarmé, as member of the Parnassians was known to see ancient Greek and Latin poetic forms as means to challenge Romanticism and renovate poetry.

[265] Vitruvius, *Ten Books on Architecture*, p. 63.

Jacques Polieri

Jacques Polieri (b. 1928) is a French stage director, stage designer and theatre theoretician closely related to the French avant-garde movement and a pioneer using multimedia and new technologies in performances and installations. At the beginning of his career and moving from traditional theatre towards an 'abstract performance', Polieri staged various plays by avant-garde theatrical writers like Jean Tardieu (1903–95)[266] and Eugène Ionesco (1909–94).[267] Polieri gained wider recognition in 1956 by co-founding and organising with architect, painter, sculptor and designer Le Corbusier (1887–1965) the First Festival of Avant-Garde Art, held at the latter's *Unité Habitation* (built between 1947 and 1952) in Marseilles. Some of the contributors to the festival include Maurice Bejart, who choreographed a performance for Nicolas Schöffer's (1912–92) *Cysp 1* (1956), the first cybernetic sculpture in art history, and Yves Klein (1928–62), who presented for a first time a monochrome (red).[268] The success of the first festival was followed in 1957 by the Second Festival of Avant-Garde Art at the *Cité Radieuse* in Nantes (built in 1955) and in 1960 by the Third Festival of Avant-Garde Art in Paris. All three Festivals proved very successful in defining a new emerging spirit in French arts, as well as Polieri's own style, which moved towards abstraction, interactivity and cybernetics. Polieri was the first stage director who integrated cameras and video projections at a performance, *Gamme de 7*

[266] Some of Tardieu's plays that Polieri staged between 1955 and 1959 include: *The Box Office*, *The Sonato and Three Gentlemen*, *Who is There?*, *Useless Politeness*, *The Apollo Society*, *The Tenses of the Verb*, *A Voice with Nobody There*, *The ABC of our life*, *Rhythm in Triple Time* and *Revival.*
[267] Some of Ionesco's plays that Polieri staged between 1953 and 1964 include: *The Motor Show*, *The Marriagable Young Girl*, *Do You Know Them?*, *The Master*, *The Hot Season*, *The Dream Cold*, *The Niece-Wife* and *The Chairs.*
[268] Michel Corvin, *Polieri: A Visionary Passion*, trans. Ann Sautier-Greening (Paris: Adam Biro, 1998), p. 137.

(1964),[269] and also produced some of the first interactive installations, like his project *Leisure Street* for the Munich Olympics (1972).

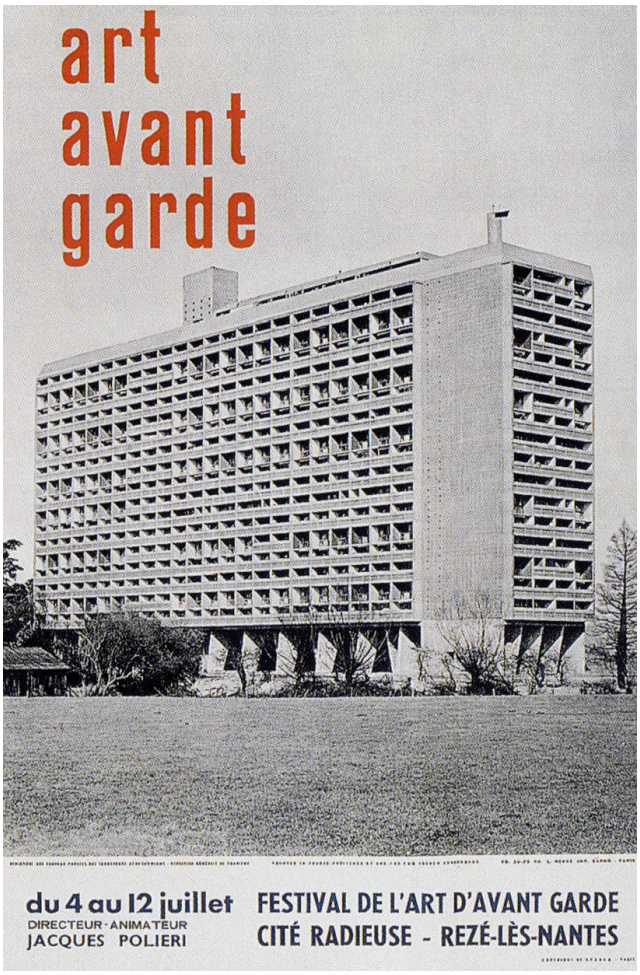


Figure 73 Poster from the First Festival of Avant-Garde Art held at Le Corbusier's Unité D'Habitation in Marseilles, 1947-1952. From Michel Corvin, *Polieri*, Paris, 1998.

Following Polieri's earliest staging and directing work, there was great interest in how space is treated and how the gaze could be drawn away from the traditional linear perspective. Being dissatisfied by with conventions of traditional Italian style theatre-spaces and their inability to express the avant-garde spirit, Polieri very soon started to consider different alternatives and possibilities for how to distribute the performance within the space of theatre. According to Polieri:

[269] Ibid., p. 239.

> All adjustments were carried out from a more or less central position, in the stalls: I had to work in 'Italian-style' theatres for the simple reason that there were no others. Once everything was defined, any change of position or of the angle of vision proved catastrophic. Everything I had adjusted so carefully collapsed, and had to be started all over again.
> However, it would of course have had to be started over for each seat in the stalls and, on the different levels, for each seat in the whole theatre.
> I thus, irrevocably, reached the point of imagining a different spectacle, visible in its entirety, but which would be enacted differently for each viewpoint. In short, one and the same spectacle, but different for each spectator.[270]

This spectacle that Polieri envisaged presupposes a 'cyclical narrative combinatory system'[271] different from what had existed so far in theatre: 'it is a way of overturning the genesis of the visual interpretation of any action by permutating the order of the observation points'. Realisations of the above idea are Polieri's 'mobile annular stage', or 'mobile theatre' (fig. 75), constructed at the American Pavilion, Exhibition Centre, Porte de Versailles in Paris (1960), and later at the Grenoble Cultural Centre (1968). It consists of a circular auditorium where the audience has the ability to rotate around the stage, which occupies the circumference of the circle. In these theatres Polieri showcased sculptures by Jacobsen, Pevsner, Brancusi, Colvin and Adam, in a spectacle using light, music by Edgar Varèse and poems by Pierre Volbout.

The top left drawing (fig. 74) can describe very clearly both Polieri's 'cyclical narrative combinatory' system and its realisation as the 'mobile annular stage'. There are very close similarities between this drawing and Llull's or Bruno's *memory wheels* analysed before in relation to mnemonics and Camillo's theatre. In general *memory wheels*' operation was based on random movement between combinations of concepts which gained a spatial translation within someone's memory. The rest of the drawings relate to Polieri's other projects and experiments with auditorium space.

---

[270] *Polieri: Creator of Modern Scenography* (Paris: Bibliotheque nationale de France, 2002), p. 8
[271] Ibid., p. 8.

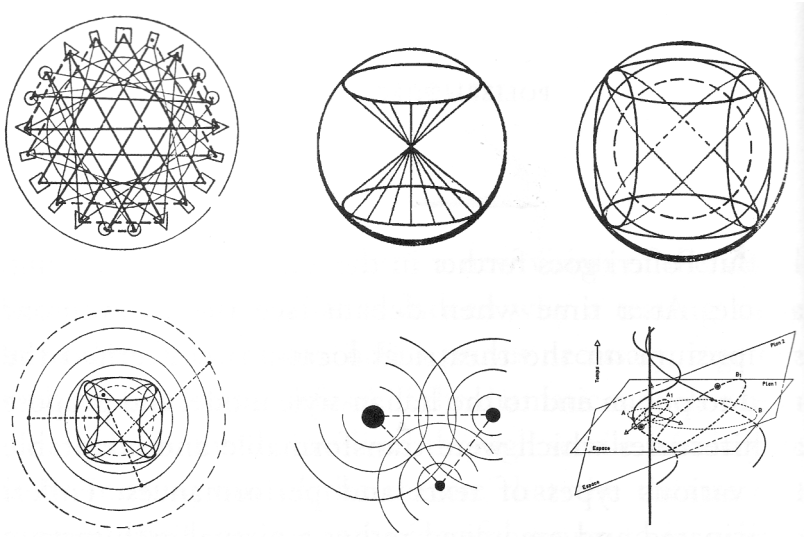


Figure 74 Jacques Polieri, 'Notation system for stage-directing in three dimensions, and complex movement auditoriums'. From Michel Corvin, *Polieri*, Paris, 1998.

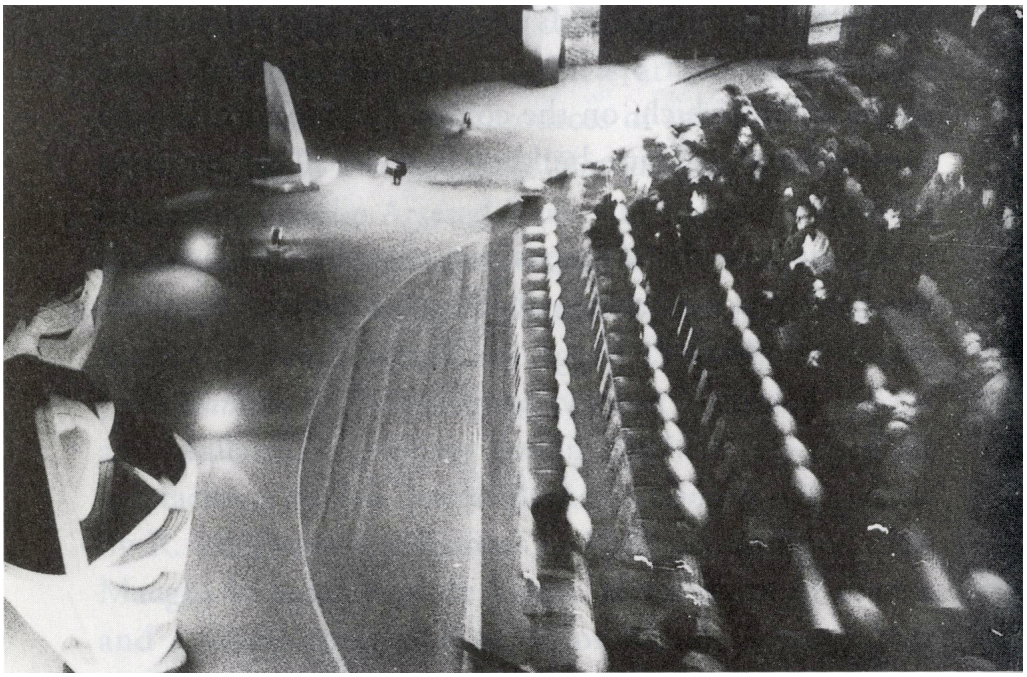


Figure 75 Jacques Polieri, 'mobile theatre', constructed at the American Pavilion, Exhibition Centre, Porte de Versailles in Paris, 1960. From Michel Corvin, *Polieri*, Paris, 1998.

Despite the innovations of 'mobile theatre', the performance would still remain centred, frontal and partially static, but it was Polieri's first step to overturn traditional conceptions of theatre space and to move towards his vision of a totally 'decentred' spectacle utilising the emerging new technologies and multimedia. This project consists of the *Theatre of Total Movement* (conceived in 1957) (fig. 76, 79, 80), designed in collaboration with André Wogenscky (1916–2004), disciple and very close associate of Le Corbusier, whom Polieri met at the terrace of *Unité Habitation* during the First Festival of Avant-Garde Art.

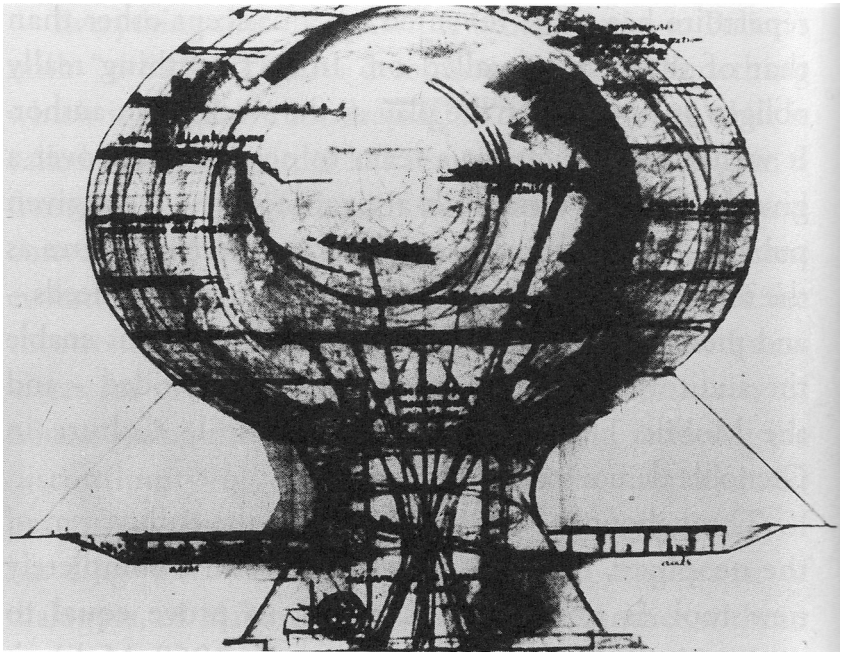


Figure 76 Jacques Polieri, sketch of the *Theatre of Total Movement*, 1957. From Michel Corvin, *Polieri*, Paris, 1998.

Polieri's *Theatre of Total Movement* could be referenced back to Bauhaus experiments that were looking to renovate the long-established space of the theatre and performances like Andor Weiningers' *Spherical Theatre* (1924) (fig. 77) and Walter Gropius's *Total Theatre* (1927) (fig. 78). In Gropius's theatre, stalls and stage

could be rotated in various configurations and there was a cinema screen incorporated within the auditorium.

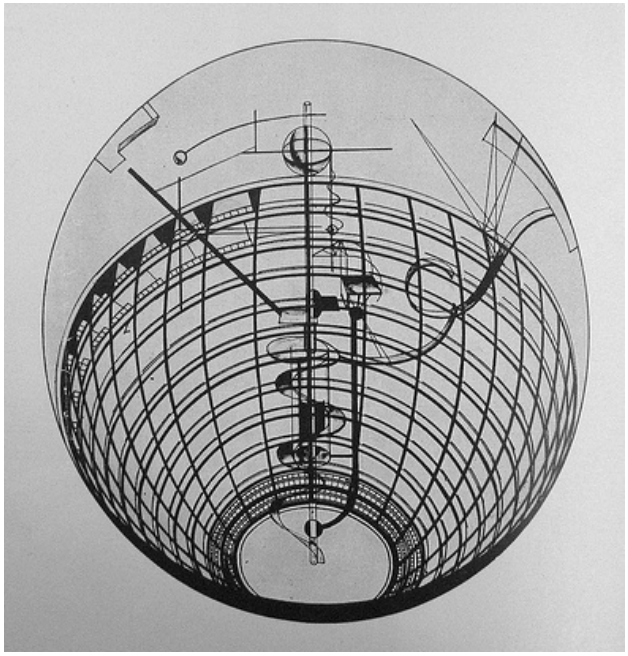


Figure 77 Andor Weininger, *Spherical Theatre,*1924. From Michel Corvin, *Polieri*, Paris, 1998.

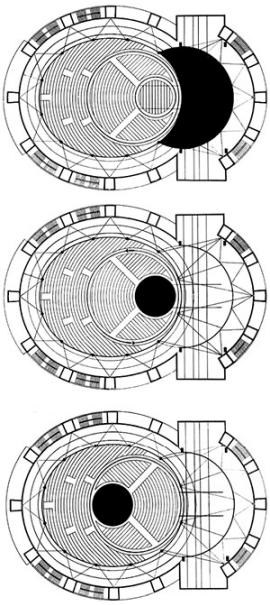


Figure 78 Walter Gropius, *Total Theatre*, 1927. From Gilbert Lupfer, Paul Sigel, *Walter Gropius, 1883-1969*, Köln, 2004.

Polieri keeps the form of Weininger's *Spherical Theatre*, and the idea of moving stages, the screens and projections from Gropius, but reverses the relation between spectacle and audience, placing the viewer in the centre of the sphere – instead of at the periphery – and thus in the middle of the spectacle. In the *Theatre of Total Movement*, (fig. 79) the stalls are being transformed into 'mobile platforms' which can move in all three dimensions of space and rotate around a central axis, while the 'spectacle takes place vertically over the whole of the horizon'.[272] Polieri built a version of the *Theatre of Total Movement* at the Osaka World's Fair of 1970, (fig. 80).

[272] Corvin, *Polieri: A Visionary Passion*, p. 125.

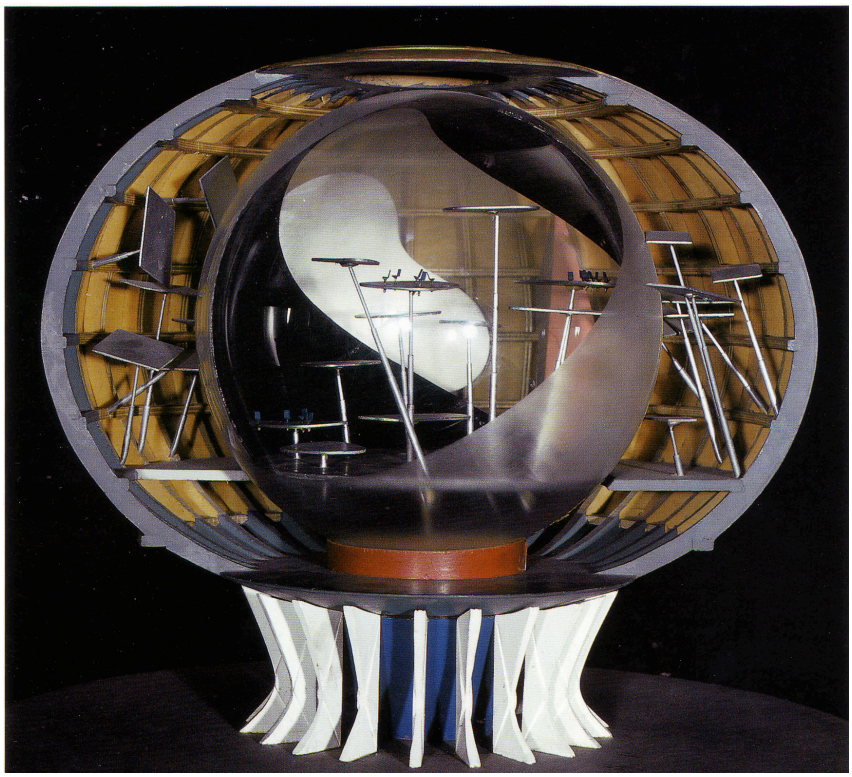


Figure 79 Jacques Polieri, model of the *Theatre of Total Movement*. From Michel Corvin, *Polieri*, Paris, 1998.

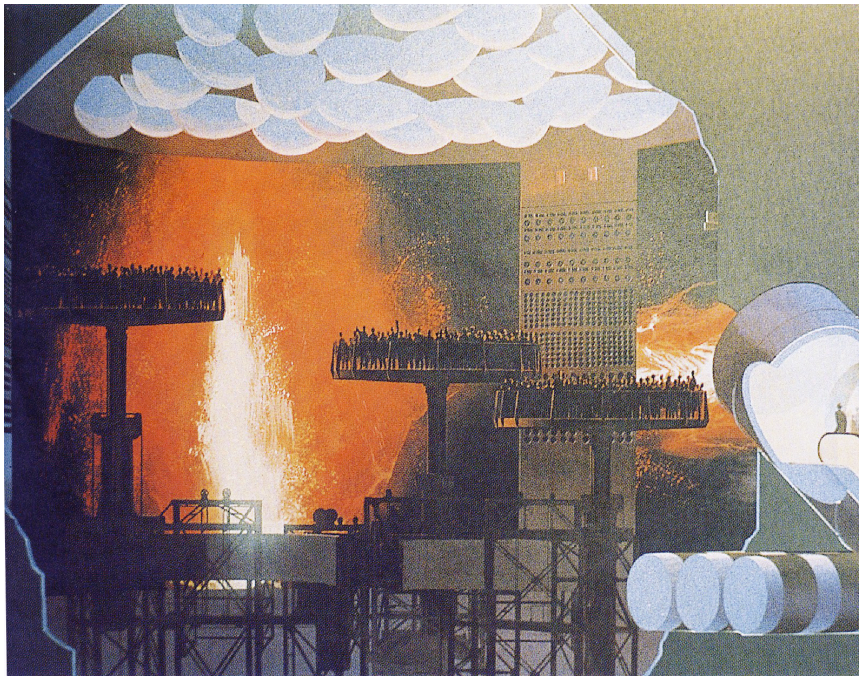


Figure 80 Jacques Polieri , image of the *Theatre of Total Movement* installation in Osaka, 1970. From Michel Corvin, *Polieri*, Paris, 1998.

Following the *Theatre of Total Movement*, Polieri continued his quest for the ideal auditorium with another project, the *Gyroscopic Satellite Auditorium*, 1967, (fig. 81) in rotation around the earth, a space totally free from gravity where the audience could flow within the spectacle. The *Gyroscopic Satellite Auditorium* provided two possibilities: '1. Mobile sphere and cube – pyramid or static cone fixed in the cube; 2. Sphere, mobile cube and icosaedron.'[273] It might possibly be claimed that with such projects Polieri moves to the realm of a sort of *utopian theatre*, expressing an emerging spirit in design expressed in twentieth-century architecture by the Russian Constructivists and later by groups like Superstudio or Archigram.

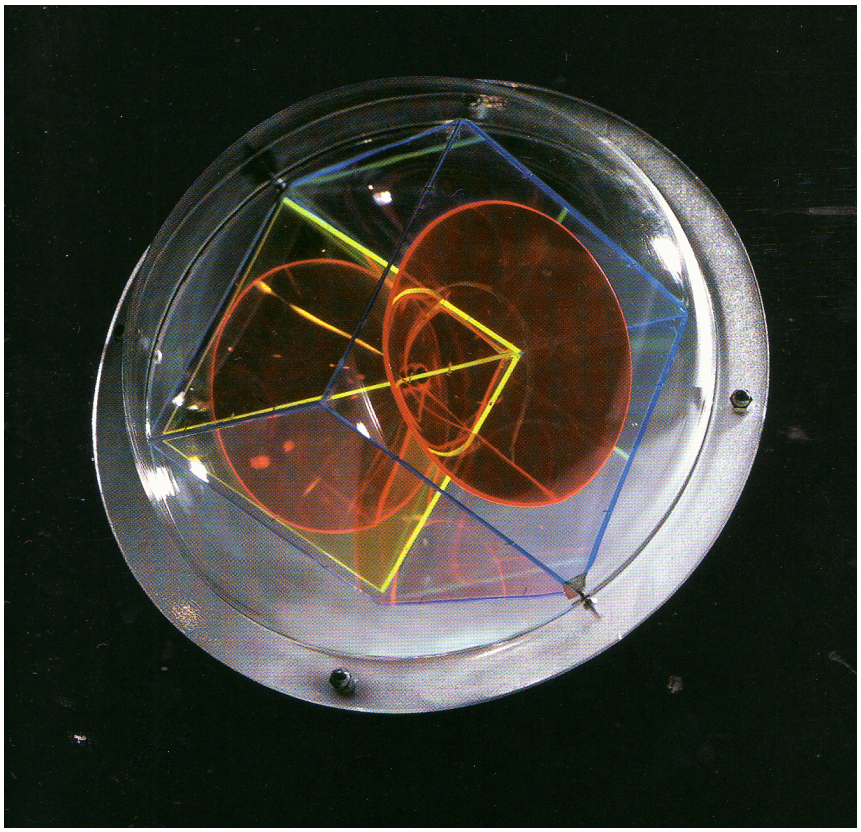


Figure 81 Jacques Polieri, *Gyroscopic Satellite Auditorium*, 1967. From Michel Corvin, *Polieri*, Paris, 1998.

[273] Michel Corvin in: *Polieri: Creator of Modern Scenography*, p. 69.

Within Polieri's course from staging plays based on text like Ionesco and Tardieu towards a more abstract 'spectacle' – important position has Polieri's staging of Mallarmé's perfomative poems/books, *Un Coup de Dés* (1959) and *Le Livre* (1967). Since Polieri conceived the idea of the *Theatre of Total Movement* and a new typology of theatre, investigates what kind of performance could be performed within such a space-auditorium. Text, in the traditional sense, becomes less significant for Polieri, who claimed in 1959: 'I no longer believe in a text on which one sticks music, gestures an intonation, a décor. I want to move towards the discovery of a new scenography.'[274] Although at first glance Polieri's claim seems contradictory to Mallarmé's vision of his poems as concrete objects, jewels or an 'arabesque', Polieri looked for a similar concrete and autonomous type of scenography; a kind of scenography that is non-static and non-linear and where the auditorium becomes actively part of the performance and the whole experience. The language Polieri is using for his spectacle consists of projections, images, sounds, auditorium and the movement of or the interactivity between all those elements and the viewer.

Polieri is possibly the first who, following Mallarmé's intention, tried to translate his poems spatially and express their performative character. It is important for this research to examine how poems/books such as *Un Coup de Dés* – which has been analysed like a spatial literary structure or a 'room of thoughts' – and *Le Livre* have been 'acted' or performed in space following Polieri's vision, and afterwards to position these examples within a tradition of text and spatiality relating also to other cases and examples analysed so far.

[274] Corvin, *Polieri: A Visionary Passion*, p. 177.

Polieri's *Un Coup de Dés*

Un Coup de Dés is Mallarmé's first poem that Polieri staged at the theatre of *L'Alliance Française,* in 1959. The performance aimed at a spatial translation of Mallarmé's poem and is one of Polieri's attempts to break the two-dimensionality and linearity of performance demanded by traditional theatre spaces. According to Polieri, quoted by his biographer Michel Corvin:

> *Un coup de dés jamais n'abolira le hasard* was an attempt at a spatial representation of Mallarmé's polyphonic poem. This spectacle launched a new technique for stagecraft. The actors and the lighting were disposed both on stage and in the auditorium to try to translate the page layout and typography of the poem. This scenographic arrangement created a stereophonic and polyvisual action fairly close to the idea that Mallarmé defined in his preface: 'the style that becomes one like a symphony …'. Projected images of films, sound broadcasts, take up in counterpoint certain parts of the text, the action occupies diagonal points in the theatre (both stage and auditorium, linked to each other by unexpected relations and interactions).[275]

The staging of *Un Coup de Dés* by Polieri seems to be a literal, concrete,[276] translation of the poem/book. The actors were scattered around the auditorium, representing the words on the pages of the poem. They were placed diagonally in order to define the space, instead of a space being defined solely by the physical limitations of the auditorium. The actors whispered or shouted the words, following the poem's different fonts and typefaces. Loudspeakers and recordings were used for echoing forwards and backwards in time the words and images of *Un Coup de Dés* exactly as it happens in the poem, where connections of words and meanings occur also in depth, behind or through the pages. According to Corvin:

> He [Polieri] arranged five actors, two on stage, one at the back of the auditorium and two at the dress circle, and also placed at the front and back of

[275] *Polieri: Creator of Modern Scenography*, p. 15.
[276] According to Corvin: 'the poem is, concretely, statialised; it is even layered in strata of audition, one could say, which gives it depth and volume'. Corvin, *Polieri: A Visionary Passion*, p. 170.

> the auditorium five loudspeakers mixing pre-recorded passages of the text with the voices of the actors, in immediate sequence, as if echoing one another.[277]

As in *Un Coup de Dés* – where interpretation and all possible combinations of reading are located within the empty space and the void – in Polieri's performance the remaining empty space of the auditorium is occupied by the audience, the ultimate generator of meaning. In this example the space of the performance is not just the auditorium but a combination of text, actors, images, sounds, audience, the connections and the movement between all of those. The staging of this performance also demanded the application and integration of some of the most advanced, for the time, technological innovations, such as projections of images and multi-directional sound coming from five loudspeakers within the auditorium. It's worth noting here that the Philips Pavilion, which was designed as a 'Poème électronique' (electronic poem), was presented at the Expo of 1958, in Brussels, only a year before Polieri's performance of *Un Coup de Dés*. The Philips Pavilion – designed by Le Corbusier and architect, mathematician and music composer Iannis Xenakis (1922–2001)[278] – is considered to be one of the first multimedia installations in the history of art and architecture. The pavilion was designed to accommodate Varèse's (1883–1965) homonymous composition of electronic music 'Poème électronique', which was played by numerous loudspeakers spread within the space, while images were simultaneously projected onto the curved surfaces of the pavilion. Polieri, in a similar context, investigating a new kind of performance and theatre space, staged his own theatrical poem, and what more suitable text than Mallarmé's *Un Coup de Dés*? Nevertheless, it is remarkable that it took almost fifty years for Mallarmé's vision of *Un Coup de Dés* to be performed live, and be transferred on stage.

[277] Ibid., p. 170.
[278] Xenakis collaborated with Polieri in the latter's performance of *Gamme de 7*, 1967.

Although is difficult, just by the descriptions, images and drawings, to imagine how the actual performance was, it seems that all of its elements – sound, images, audience and auditorium – operated as different layers or levels, which when superimposed produced the totality of the performance's space (fig. 82). Although Polieri acknowledged the dimension of depth for both the poem and the performance, it is not clear how he worked on the connections between all these layers: for example, on the symmetries – such as palindromic symmetry at the centre of the book – and the forces that keep together this vertical dimension and the time of the poem to create the powerful image-structure of the whirlpool. But possibly all these values, being inherent already in the poem by Mallarmé, did not require more than the literal and concrete interference by the director to be expressed in the performance and to generate the experience of space, as in the random gesture of throwing the dice.

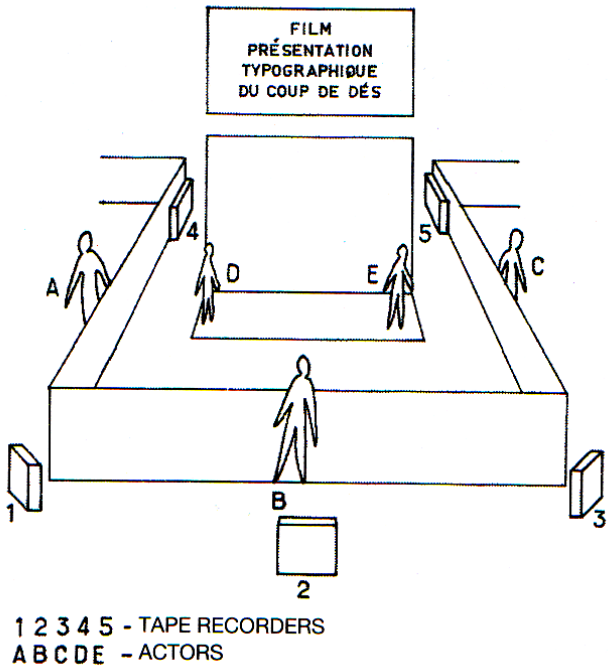


Figure 82 Jacques Polieri, stage arrangement of *Un Coup de Dés* and distribution of actors, speakers and projection, 1959. From Michel Corvin, *Polieri*, Paris, 1998.

Polieri's *Gamme de 7* and *Le Livre*

In 1967 Polieri staged two very closely related performances, *Gamme de 7* and Mallarmé's *Le Livre*. Not only did the staging of these pieces involve an unconventional, for the time, spatial distribution of actors, video-projections of digital media for the first time in theatre, and sounds within the auditorium, but it also demanded significant modifications of the auditorium's space, such as long movable platforms and multiple stages at different levels.

Gamme de 7 was first staged 'imperfectly' at Théâtre Gérard Philip, in Saint-Denis, 1964, (fig. 83) and for the second time 'perfect' in Théâtre du Rond-Point des Champs-Elysées, 1967, (fig. 84).[279] In Saint-Denis there was built a second stage with a glass floor on top of the traditional one. Above these stages were projected digital images on a large scale, using a unique for the period 'eidophor system'. On each side of the auditorium were positioned two more platforms, with two blocks with glass floors on top of each of them. These stages, platforms or blocks were used simultaneously by the performers who could move on top of or around them. The audience was positioned in the middle of the space and was surrounded by the platforms. Three years later, in Champs-Elysées, the side platforms were connected with the frontal one, forming a 'horseshoe around the spectators',[280] and the screen was on the side, permitting the projecting images to be superimposed with the performers. All these different levels permitted the spatial distribution of the spectacle and actions of the performers, who were dancers and mimes. The music was composed by Xenakis and varied from electro-acoustic to orchestral and even to stochastic.

[279] Corvin, *Polieri: A Visionary Passion*, p. 235.
[280] Ibid., p. 240.

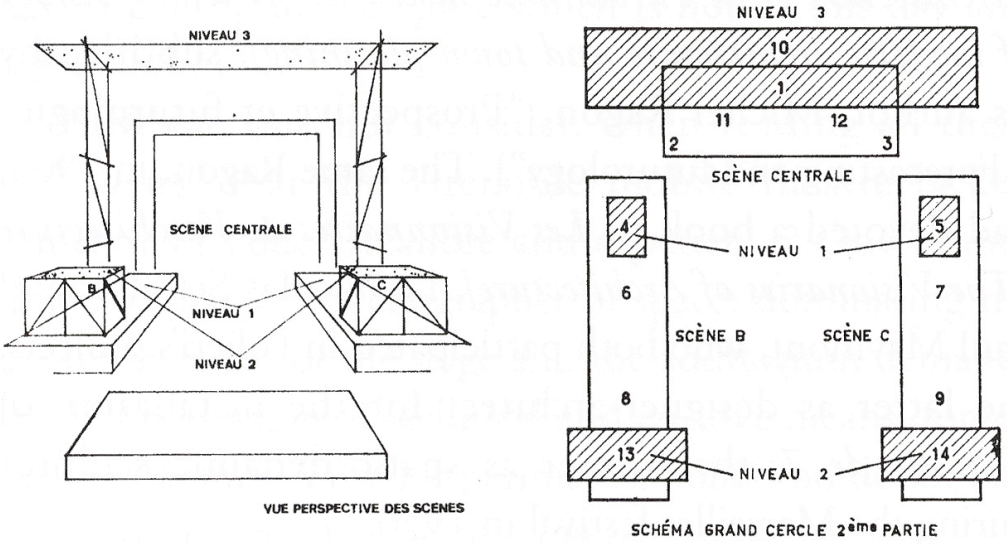


Figure 83 Jacques Polieri, stage arrangement of *Gamme de 7* at Théâtre Gérard Philip, Saint-Denis, 1964. From Michel Corvin, *Polieri*, Paris, 1998.

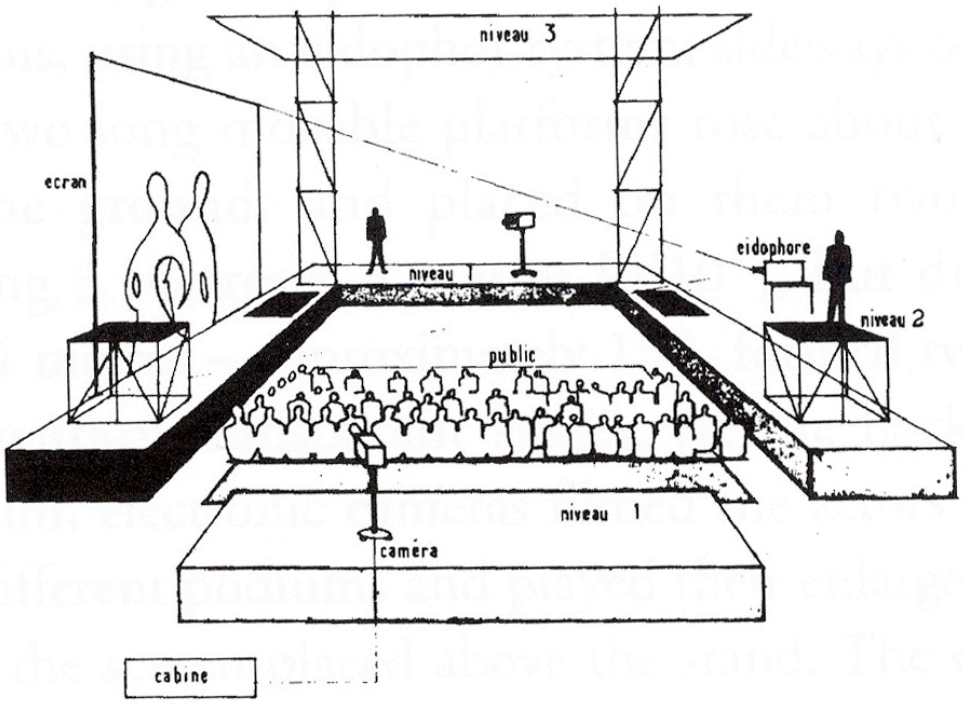


Figure 84 Jacques Polieri, stage srrangement of *Gamme de 7* at Théâtre du Rond-Point des Champs-Elysées, 1967. From Michel Corvin, *Polieri*, Paris, 1998.

The content of *Gamme de 7* was highly abstract, and according to Polieri, quoted by Corvin, 'a succession of visual and gestural expressions constituting a sort of "keyboard" and linking between them the different means of gestural expression (pure expressions and gestural expressions) … the gesture being reduced to a sign'. By 'gestural expression' Polieri refers to mimes and by 'pure expression' to the dancers; the gestural language was created by Maximilien Decroux, founder of the school TEMP (Théâtre Ecole Mouvement et Pensée – Movement and Thought Theatrical School).[281] The whole spectacle was divided into three parts and aimed, according to Polieri, at organising these 'pure' and 'gestural' signs from 'a simple perspective space to a multiple perspective, to attain finally three-dimensional space; a sort of conquest of space'.[282] In other words, it seems that Polieri aimed to move in three parts from one-point or centred representation, which refers to the traditional theatre stage, to a planar representation based on a distribution between multiple layers – like the performances of *Un Coup de Dés* and *Mobile* – and from there to a de-centred or spatial representation based on connections between multiple planes and angles within the auditorium.

The seven mimes and seven dancers who performed *Gamme de 7* were positioned in different places and levels within the auditorium, and in solos and groups they draw geometrical forms like triangles, circles or spirals in two or three dimensions (fig. 85).

[281] More information in: Ibid., p. 236.
[282] Ibid.

Figure 85 Jacques Polieri, *Gamme de 7* at Théâtre du Rond-Point des Champs-Elysées, 1967. From Michel Corvin, *Polieri*, Paris, 1998.

Ideally Polieri's *Gamme de 7* was a much larger project which involved, apart from the seven actors and seven mimes, also seven actors and one singer, $(3 \times 7) + 1$, in total $21 + 1 = 22$ performers.[283] It seems that ideally at the first part of the performance $1 \times 7 = 7$ signs or performers would represent the point or the linear perspective, at the second $2 \times 7 = 14$ performers would represent the plane, the planar or layered distribution within space and at the third $3 \times 7 = 21$ would represent the spatial distribution and produce the total experience. In all cases the singer operates as the generator of rhythm between elements or signs of each part.

[283] 'For practical reasons, the 21 protagonists of the original scale have been reduced to 14 characters: 7 male characters in the first part, duplicated by seven – two men flanking five women – in the second part'. [Polieri] Ibid., p. 239.

In the ideal situation, three-dimensions to seven performers-signs, in total twenty-one, plus one singer, would express the totality of possibilities of spatial combinations between spoken (actor), gestural (mime) and pure (dancer) signs, and like this the play would acquire its proper, spatial scale. According to Corvin:

> Then, a real scale could have been constituted by distributing the different instrumentalists as follow: **dancer/mime/actor/singer/actor/mime/dancer**. As Polieri says, 'the principle of this *scale of 7* is related to a concern for the spectacle's rhythmic whole'. Indeed, but with the supplementary condition that this sequence of seven notes should form and close the circle in a circle of 21 which would be 'the direct transposition of the preceding composition for a stage with 360° visibility', which unfortunately Polieri did not have at his disposal. Ideally, only a mobile annular stage on which the 21 artists would be disposed would provide the polyvisual spectacle conceived with a simultaneity and development both temporal and spatial.[284] [emphasis added]

In this 'mobile theatre' the vision of the spectator widens scientifically but the *Theatre of Total Movement* seems to be an even more adequate auditorium to house the original idea of *Gamme de 7* because it offers not only a 360° angle of vision but also the possibility of the desired arrangement of the performance freely at various different levels in all the dimensions of space.

Polieri's ambition with *Gamme de 7* was to create a new scenography and a totally new spectacle in a new space that had never been experienced before. The spectator is placed in the centre of the performance's space, being free to create connections between its elements based both on a random position within the spectacle and on desire. According to Corvin, this is the originality of the performance: 'The originality lay essentially in this combination of an exploded spatial mechanism (by levels and by development) with a braiding of gestures which, arriving from the eight theatrical points, wove in all directions, over the spectators' heads, the volume-canvas of the theatre.' The theatre in *Gamme de 7* aims to become a 'volume-canvas', an ever changing three-dimensional abstract image based on

[284] Ibid., p. 238.

'spoken', 'pure' and 'gestural' signs, leaving the connections of meaning to the individual's action of both sight, imagination and memory.

As in Camillo's *Memory Theatre*, analysed before, Polieri is trying to reverse the traditional relation between audience–spectacle, place the human in the middle of theatrical space and immerse the spectator within the spectacle, recreating a 'total' experience of the world by using a combinatory mechanism of signs. Both Camillo's and Polieri's examples are highly visual, aiming to activate a spatial experience based on sensory, perceptional and mnemonic responses.

According to Polieri, in *Gamme de 7* 'the principle of this *scale of 7* is related to a concern for the spectacle's rhythmic whole'. All the signs Polieri employs – spoken, pure and gestural – form a sequence which has at the centre a singer, possibly we could call it an aural sign, that provides the desired rhythm around which all of the performance's signs revolve: dancer/mime/actor/**singer**/actor/mime/dancer (fig. 86). This use of music or singing in the above process recalls the example of Vitruvius, who manifested in architecture and writing that rhythm or 'analogy' between the elements of a building, book or an argument is what keeps together the space they create.

It is very interesting that the sign-sequence – D/M/A/**S**/A/M/D – on which Polieri bases his performance of *Gamme de 7* and the rhythm which the 'singer' provides to the spatial evolution of signs in the auditorium is a palindrome. But this sequence is not only linear but also being distributed on different stages, overlaid in different levels and angles in the space of the auditorium.

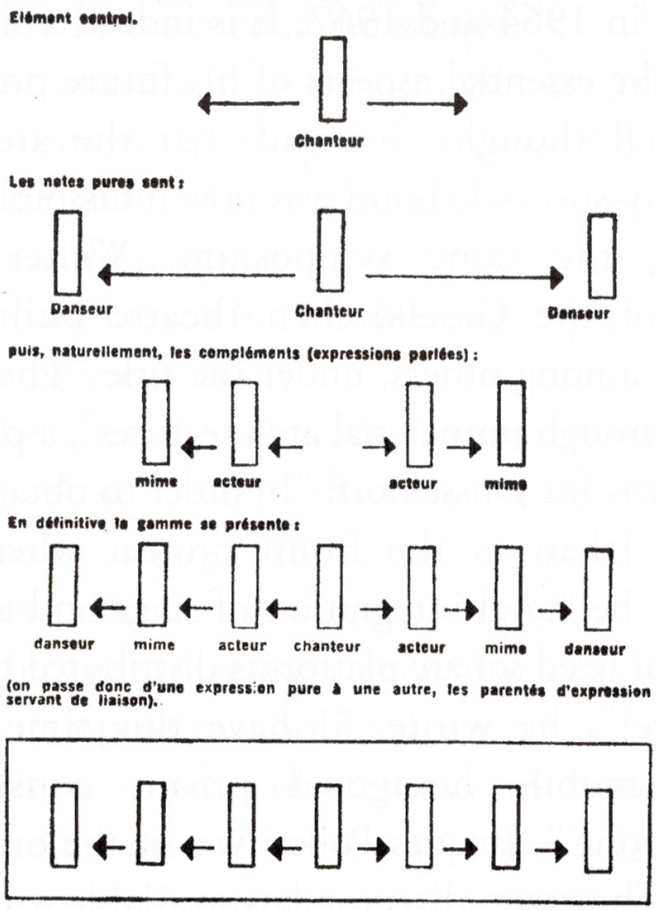


Figure 86 Jacques Polieri, conceptual sketch of *Gamme de 7*, which demonstrates the palindromic sequence of the performances' structural signs. From Michel Corvin, *Polieri*, Paris, 1998.

Likely the palindrome is employed here, as in other examples witnessed so far, as the mechanism that keeps together the spatial distribution of the performance's signs. Otherwise the abstract 3 × 7 signs of *Gamme de 7* and the combinations between them would run the danger of getting dispersed and lost in the space of the 'de-centred' performance or the 'de-centred' auditorium. It seems that for Polieri the palindrome has the ability to relate and mirror forwards and backwards in the performance's time and space the 'pure', 'gestural' and 'spoken' signs scattered all over the auditorium – a function similar to that of the palindrome in the middle of the poem-book *Un Coup de Dés*, where it initiates the image of the whirlpool and keeps

the space of the poem together, or to the general use of the palindrome in domes and arches, in books and buildings, as has been seen in other examples.

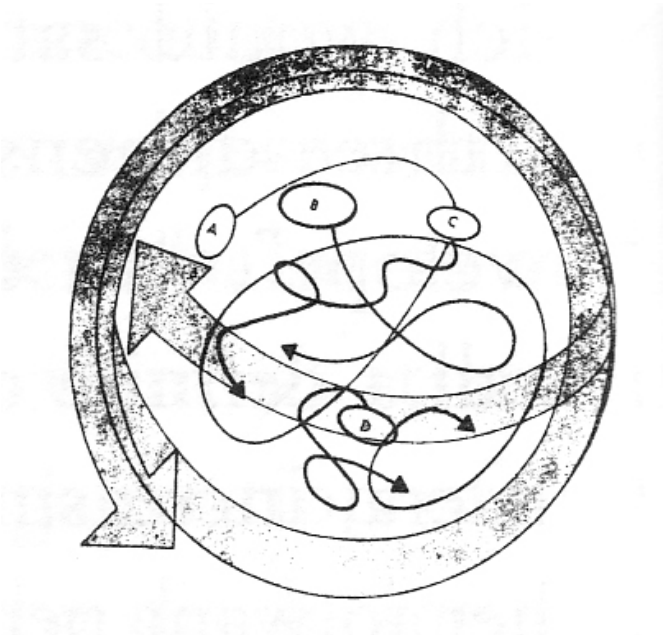


Figure 87 Jacques Polieri, sketch of 'Notational System for stage-directing in three-dimensions, and complex movement auditoriums'. From Michel Corvin, *Polieri*, Paris, 1998.

Polieri's staging of Mallarmé's *Le Livre* was held at the same theatre only a week after *Gamme de 7*. The arrangement of the stages, platforms and projections in the auditorium was almost identical to the previous production, with the difference that this time Polieri added another platform at the back of the auditorium to close the space and arranged the audience in two groups facing each other. The projections Polieri used this time were images and close ups of the actors as well as sketches and three-dimensional drawing interpretations of Mallarmé's *Le Livre*.[285]

[285] Ibid. p. 254.

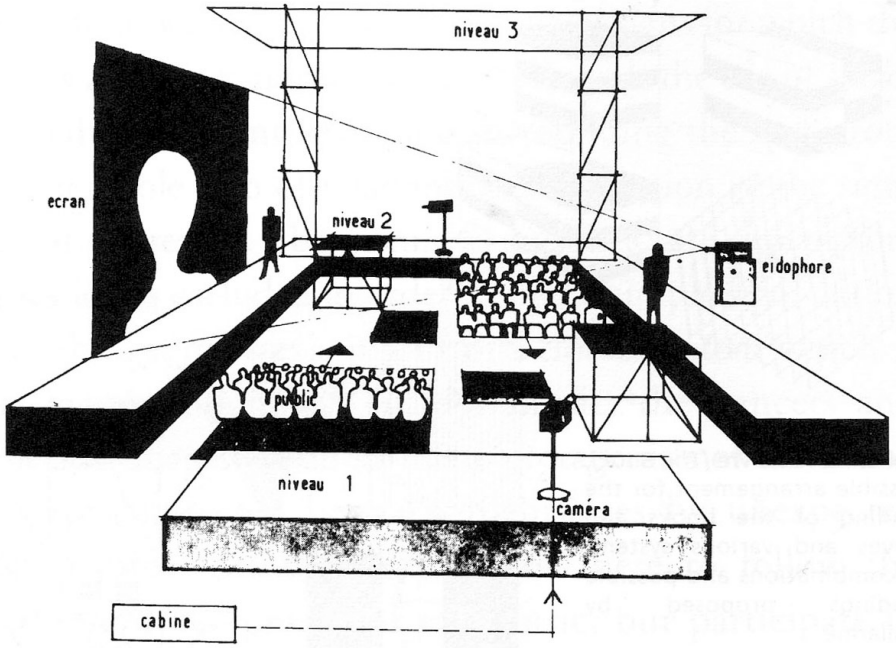


Figure 88 Jacques Polieri, stage arrangement of *Le Livre,* Théâtre du Rond-Point des Champs-Elysées, 1967. From Michel Corvin, *Polieri*, Paris, 1998.

For this performance Polieri worked very closely with Jacques Scherer, long-time scholar of Mallarmé, who collected, edited, analysed and published for the first time Mallarmé's notes for *Le Livre*. Taken from the spectacle's programme, quoted by Corvin, here Scherer clarifies how he adapted for theatre Mallarmé's difficult, fragmented and even obscure text:

> A quality of nascent, effervescent, thus strange, purity seems to me to distinguish the four poetic fragments found in the manuscript of *Le Livre*. I have used them in their entirety, alternating them with explanatory passages. This alternation is the very foundation of the *Le Livre*, where abstract thought and poetic content should be one and the same thing, if it is true that the form of *Le Livre* creates its content and that poetry is an image of the calculation. The first passage defines the general ambition of *Le Livre*; the other three introduce the increasingly complex calculations on which the structure is based. Finally, I have gathered in a short prologue some of Mallarmé's most brilliant declarations on the implications of his undertaking.[286]

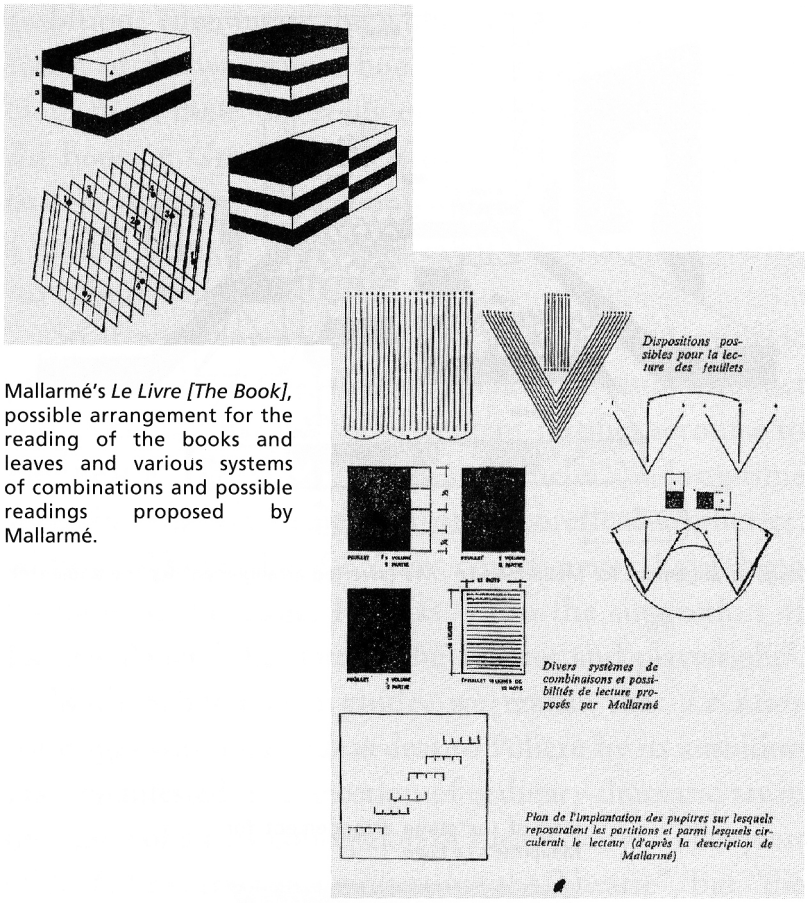
Scherer decided that *Le Livre* should be delivered by six characters, three male and three female, called the 'Operator', 'Calculator', 'Master', Nymph', 'Siren' and

[286] Ibid., p. 253.

'Herodias'. The number that governed this performance was four, 4. This is because, according to Mallarmé's intentions, *Le Livre* consisted of four books which could be seen as a unity but also as distinct solid units or cubes. A similar example of such a 'poetic' block or cube is *Un Coup de Dés* – Mallarmé's first experiment towards his more ambitious project *Le Livre* – with its unbound pages and its meanings and concepts being able to be reshuffled like throwing the dice. Each of *Le Livre*'s four blocks seem to operate autonomously but also in combination with the other ones in various combinations, producing the final, fifth object which is an ever-changing book, according to Mallarmé an 'Orphic explanation of the world'.

The words between the pages of each of the books, the pages between the books and the books between the books could be moved around and combined following patterns based on fonts, font sizes and highly calculated geometries and symmetries orchestrated by the poet. *Le Livre*'s reading as a whole seems to be based not only on depth within each of its volumes – as in *Un Coup de Dés* – but also on different angles of viewing, according to which the order of the volumes could be moved around and changed, producing endless possibilities of reading (fig. 89).

The number four, both for *Le Livre* and possibly for its staging, relates to the Pythagorean tradition and the idea of the tetraktys – analysed before – according to which (1) represents the point, (2) the line, (3) the plane and (4) the solid. A more or less similar idea was employed by Vitruvius in the structuring of the *Ten Books on Architecture*, as noted by McEwen. According to the Pythagorean theory, four as a number could be combined in creating the tetraktys, the five, an object and symbol which is the base of the world's construction.



Mallarmé's *Le Livre [The Book]*, possible arrangement for the reading of the books and leaves and various systems of combinations and possible readings proposed by Mallarmé.

Figure 89 Jacques Polieri, drawings demonstrating how *Le Livre* operates spatially. The books are represented by blocks and the reading can be in different layers. On the right, we can observe that reading of *Le Livre* depends also on the angle from which you look at the object/book. From Michel Corvin, *Polieri*, Paris, 1998.

The play of *Le Livre* was arranged in four parts like the book, according to Corvin: 'four poems, a prologue, four descriptions'; he continues 'as for the symbolism of the square and of the figure 4, it could be spotted – by an apprised eye – from the number and arrangement of the movable platforms, the meeting points and the diagonals, divisions and subdivisions of the areas reserved for the actors'.[287] The four movable platforms complete a square and create a closed shaped space (fig. 90) like Mallarmé's space of *Le Livre*, which is a book. The performance seems to be organised in a way to create an experiential space of sign-combinations – a

[287] Ibid., pp. 255, 257.

constellation like *Un Coup de Dés* or, according to Barthes, a 'galaxy of signifiers' – similar to *Gamme de 7* (which is governed by the number seven, 7) and the combinatory evolution of seven signs in a progression from the linear perspective to the three-dimensional spatial experience.

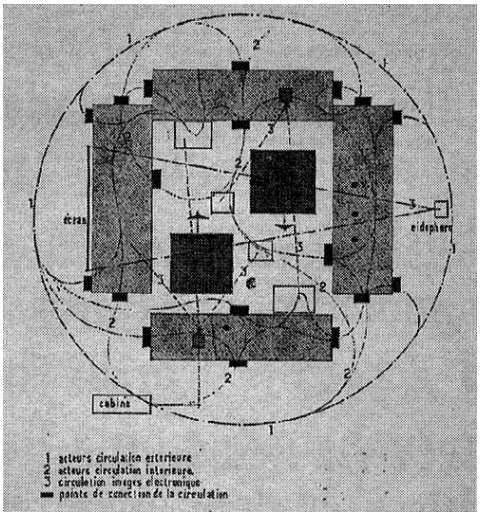


Figure 90 Jacques Polieri, drawing demonstrating the spatial distribution and movement of actors, sounds and images of *Le Livre*. From Michel Corvin, *Polieri*, Paris, 1998.

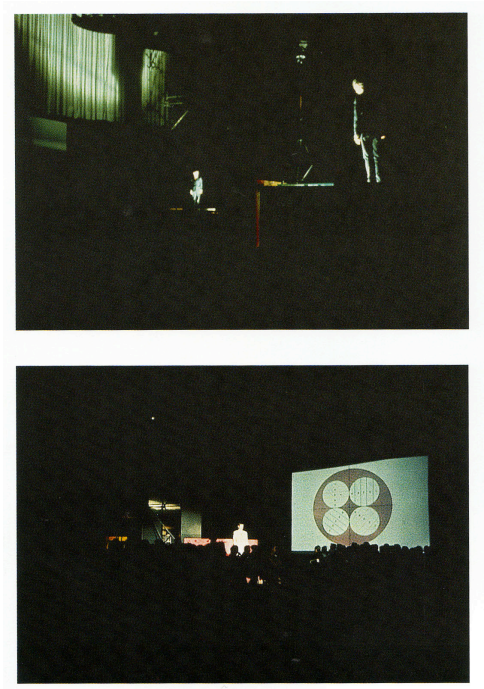


Figure 91 Jacques Polieri, *Le Livre*, Théâtre du Rond-Point des Champs-Elysées, 1967. From Michel Corvin, *Polieri*, Paris, 1998.

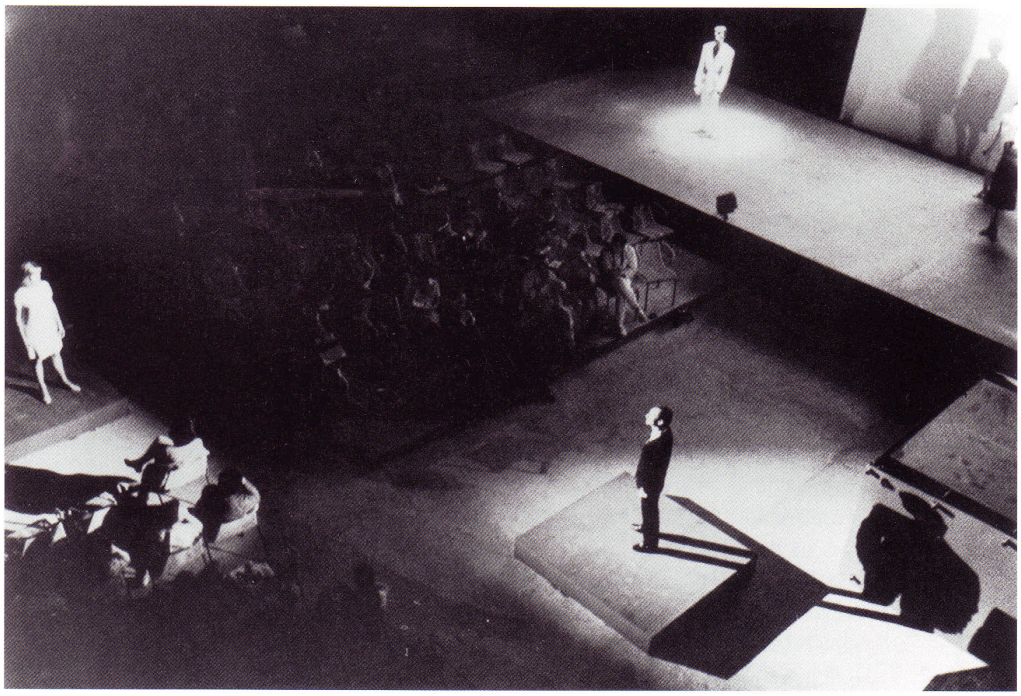


Figure 92 Jacques Polieri *Le Livre*, Théâtre du Rond-Point des Champs-Elysées, 1967. This image shows the distribution of actors, the placement of the audience and different levels of the performance. From Michel Corvin, *Polieri*, Paris, 1998.

The two performances, *Gamme de 7* and *Le Livre*, share many similarities: they were performed in same theatre with only a week between them, with more or less the same stage arrangement and with similar organisational principles and aims. In fact *Gamme de 7* and *Le Livre* seem to be complementary in the sense that the first employs 'gestural' and 'pure' signs and the second is using only actors and text, without any other modes of expression such as dance, mimes and music. In *Gamme de 7*, contrary to the original idea, there was no text because of the space's restrictions and in *Le Livre* only text was used, but not dancers, mimes and music. *Le Livre* required some movement of the actors around the platforms but without this becoming a distinct structural element of the performance. Both the performances aim to create a solid spatial experience by the manipulation of signs, their structure, character, materiality and the geometric relations between them.

Polieri's reading of Mallarmé in *Le Livre* as before in *Un Coup de Dés* is highly spatial; he draws axonometric sketches and captures the spatial qualities of the book and its combinational possibilities in a performance and auditorium which aims to create – similar to the book – a solid but de-centred experience. Possibly all other modes of expression such as dance, mimes and music were left out from the final production of *Le Livre* to acknowledge Mallarmé's vision of a total text: a perfomative poetic-text that brings together all the arts such as painting, music and dance. The words Mallarmé evokes in his poetry have inherent in their form and structure the qualities of musical or gestural expression, demanding only their truthful delivery by the actors and their accurate distribution in the auditorium's space to generate the experience of *Le Livre*, the 'Orphic explanation of the world'. For example, within the text of *Le Livre* is hidden already by the poet the rhythm of the singer of *Gamme de 7*, similarly to the hidden name of God in anagrammatic poetry.

It is very likely that with the staging of Un Coup de Dés and Le Livre Polieri explored in scenography what Mallarmé intended to investigate for poetry. Mallarmé employing all the possibilities of language, and pushing the available technology to its limits explored the potentiality of non-linearity in poetry, aiming to express a total vision for the arts and the world, an 'Orphic explanation of the world'. [288] Similarly, Polieri by a fusion of all the arts – gestural, expressive, spoken, visual and aural signs – and the use of technology challenged theatre's linear perspective and as a consequence the linearity of meaning, to create a total spectacle which is in constant motion between theatre, music, poetry and image, all encompassed in his most ambitious project, the Theatre of Total Movement.

[288] It has been mentioned before that it took almost seventy years for the publication of *Un Coup de Dés*, that was closer to Mallarmé's specifications. This was mainly due to the difficulty of undertaking such a printing task at the beginning of the twentieth century.

Georges Perec

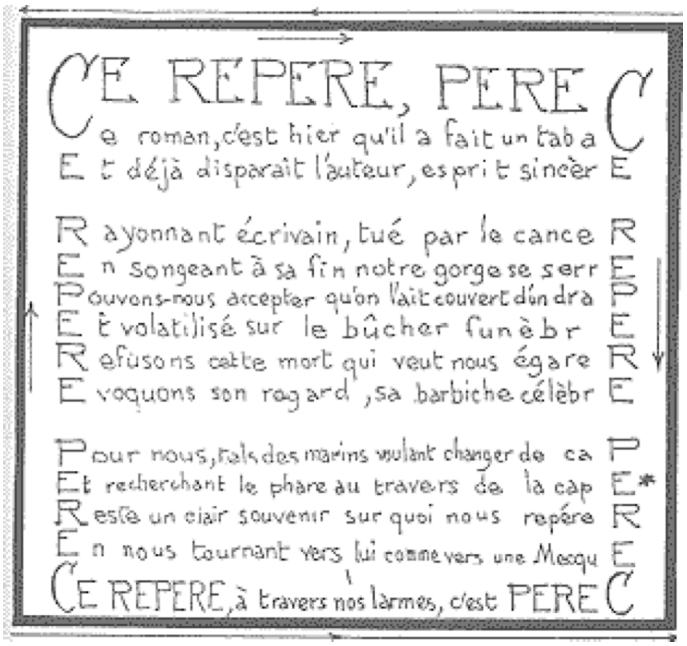


Figure 93 Palindrome dedicated to Perec. From Harry Mathews and Alastair Brotchie, *OuLiPo Compendium*, London, 2005.

Image and Memory

Used as mnemonic devices, palindromes suggest that memory has both a topological and a temporal function related to how images are inscribed, stored and recollected: topological because memory is organised by distributing images spatially (in the case of the palindrome symmetrically); and temporal because recollection and circulation between these images is closer to a non-linear perception of time, to the 'mythical time' as defined by Eliade[289] or to Nietzsche's 'eternal return of the same'.[290] Trying to place palindromes in this context and to extract their spatial characteristics, we will examine the topological nature of constraints in literature and architecture, as well as their implications for memory, by looking at mnemonics and recent examples.

The image is a link between memory and literature under constraint,[291]relating the topography of our mind to the material space that surrounds us. On the one hand through images we can perceive space, and on the other, experience space, express ideas or gain consciousness, creating material manifestations such as books, buildings or other images. It is a forwards/backwards movement concerning the perception of images, their storage and re-arrangement in the creation of new ones.

When applied to literature, geometrical and mathematical linguistic constraints like the bi-Latin square, acrostics, lipograms or palindromes are considered to be mnemonic devices, either by facilitating memory or by creating mental images, imaginary topographies and ideas, which, in their turn, seem to contain both visual and mental sites of sight. In other words, constraints stand between the world of dreams and the world of the senses.

[289] Eliade, *The Myth of the Eternal Return*.
[290] Stambaugh, *Nietzsche's Thought of Eternal Return*.
[291] The alphabet can be viewed as an abstraction of a system of communication based on images: the hieroglyphics which later developed into the Phoenician alphabet and later to the Greek and the Latin.

In mnemonics, image is above all the mediator between sight and memory. Of all the senses, sight is the most important in the creation of memory, related to the actions of writing, reading and the storage of images in memory. As Yates observes:

> The art of memory is like the inner writing. Those who know the letters of the alphabet can write down what is dictated to them and read out what they have written. Likewise those who have learned mnemonics can set in places what they have heard and deliver it from memory. For the places are very much like wax tablets or papyrus, the images like the letters, the arrangement and disposition of the images like the script, and the delivery is like the reading.[292]

The page and memory – both surfaces of writing – acquire spatial features and enter into a dialectic exchange with the aid of images, as both letters and places are considered to be images. There are the two sides to the question: How does sight contribute to the creation of images? And how does memory contribute to the way we see things, or what we see in things?

According to Lotman, in design the 'spatial image of the universe' is positioned between cultural constructs and architecture; it stands in the middle, exposed in imitation and creation. Architecture copies this image and therefore contains humanity's 'cultural space', but also contributes to its creation by providing perception and memory to the images created by the experience of space:

> Humanity, immersed in its cultural space, always creates around itself an organized spatial sphere … There is a two-way connection: on the one hand, architectural buildings copy the spatial image of the universe and, on the other hand, this image of the universe is constructed on an analogy with the world of cultural constructs which mankind created.[293]

Using the example the palindrome (fig. 94) created by chess player, composer, puzzle author and mathematician Sam Loyd (1841–1911), in *Cyclopedia of 5000*

[292] Yates, *The Art of Memory*, p. 19.
[293] Yuri M. Lotman, *Universe of the Mind: A Semiotic Theory of Culture*, trans. Ann Shukman (London and New York: I.B. Tauris & Co. Ltd, 1990), p. 203.

Puzzles, Tricks, and Conundrums (With Answers)[294] (1914), we will examine how constraint related to image acts as a kind of mnemonic device.

Figure 94 Samuel Loyd, *Alice in Wonderland* palindrome. From *Cyclopedia of 5000 Puzzles, Tricks, and Conundrums*, New York, 1914.

It is not only that the palindrome combined with the image will help us remember the phrase more vividly and longer. The above palindrome as a linguistic constraint seems to reflect the action of 'seeing' by questioning the procedures of our sight by the procedures of memory, and that is why this image questions the fact that

[294] Many mathematicians fell into the error of attempting to solve Alice's cryptogram of 'Was it a cat I saw', upon the basis of there being twenty-four starting points and the same number of endings. They reasoned that the square of 24, viz. 576 different ways, would be the correct answer. They overlooked the **branch routes** which give exactly 252 ways of reaching the centre, C, and as there are just as many ways of getting out to the Ws, the square of 252 gives the correct answer as 63,503 different ways. 'How we knew that Annapolis was the hidden city!' Samuel the Younger Loyd, *Sam Loyd's Cyclopedia of 5000 Puzzles, Tricks, and Conundrums (with Answers)* (New York: The Lamb Publishing Company, 1914), p. 164.

we really see a cat in front of us. Alice is watching a cat obviously, as we do, but questioning her senses also questions our vision. In the backwards palindromic movement there is something hidden from our sight; reversed, the text reads the same, and the letters are the same but our memory has to recreate or rearrange their order with internal sight. If it was not for our memory and our training with letters' materiality to mobilise the reverse procedure of reading then the palindromic text would read:

In this sense the palindrome's symmetry has more to do with a mirrored distribution of elements than reflection.[295] The image of Alice in Wonderland gives a hint that things are not as they appear to be and that something hidden exists in the backward palindromic movement of recollection. It is not coincidental that Loyd chose this specific image from Lewis Carroll's book to illustrate his palindrome: it denotes Alice's swing between a mental landscape and reality. Carroll's interest in word games, letter permutations, and literary and logical paradoxes is well known. Within the grid, Alice's and the reader's gaze contains 63,503 possibilities or combinations for looking or movement. The above constraint opens up an experience of meaning in thousands of possible directions which at the end fold up to only one.

Extending the above concepts, we can describe memory as inhabiting form, in the shape of either letters or edifices, and recollection as the temporal experience of form. For example, on the space of the page, the arrangements of forms – the letters and their geometry – is the procedure of writing. The procedure of reading is the act

[295] The non-perfect palindromic symmetry relates also to the concept of deviation or clinamen in OuLiPo's and Perec's literature and more specifically in Bartlebooth's palindromic story in *Life A User's Manual*.

of recollection as a temporal experience of space-form, of letters and the space of the page where those exist. If we consider that memory is constrained in form and experience is temporal rather than spatial, this temporal flow gives the possibility of a backward movement. Palindromes as structures manifest the above ability as they liberate movement in time and, thus, experience. This occurs because there is a basic distinction: although spatial experience of time is linear, memory is not experienced linearly, and although time flows more like a river in one direction, the experience of time through memory has the ability of travelling in many directions. Time in our lives cannot be frozen, stopped or reversed, but our experience of time and space through memory can. This is probably one of the main reasons why writers like Perec and Italo Calvino (1923-1985) or the OuLiPo group experimented with the experience of memory using non-linear narratives and constraints, and why constraints and letter permutations are considered to be mnemonic devices. When one reads a book, time flows in a linear way, but when one recalls what one has read the concept of time changes completely; we have to go back and forth, overlay and fragment its continuity.

The work of the OuLiPo group will be central to finding the relation between writing under constraint – palindromes are but one of many forms – and the creation and storage of images. Writers who belong to that group, like Perec, not only investigated the relation of literature and memory but extended those questions to space and architecture. First we will examine how the members of that group used architecture as a literal tool to explore the relation of image-memory, and then try to see how architecture affects those concepts and how it has been affected by them, for example in Libeskind's reading, memory and writing architecture machines.

In architecture, if we think that memory is contained in form, buildings and monuments, and that experience is a temporal flow – rather than spatial – buildings would be like vessels and experience like watching a corpse in its deterioration. But recollection through the procedures of images in our memory is not a flow and has all the abilities mentioned above; it can travel in time, overlay and fragment. And recollection is what brings life to buildings and transforms design from a brief to a creative procedure. Does architecture under constraint have an effect similar to literature under constraint in someone's memory? Do constraints in architecture in structures like labyrinths, corridors and staircases function in a way similar to that in literature? And how does such architecture come to be designed?

Literature under Constraint

Constraint is a law or a mechanism which is applied to a text by the writer. When this mechanism is generated it produces a very austere order that the text has to follow, prohibiting other possibilities. It is like the genetic code of a text according to which the linguistic material is combined and arranged on the page. If we consider that the fundamental elements of literature are letters – with their geometry, and phonetic and semantic value – while the page is the material space of literature, constraint is the law responsible for deciding which of the infinite possible combinations of letters will occur, not only the imagination of the writer. Although it sounds like a very limited method of writing, it was used as a means of releasing the creative power of the writer and exploring new forms of literature, especially for literary groups like OuLiPo. The group OuLiPo was formed by Raymond Queneau (1903–76), poet and novelist, in 1960 and the name stands for Ouvroir de littérature potentielle (workshop of potential literature). Some of the most celebrated members of OuLiPo incude François Le Lionnais, Claude Berge, Perec, and Calvino.

Laws of constraint can be purely linguistic like the anagram or the pangram, geometrical like the ambigram, or mathematical like the palindrome, lipogram and bi-Latin squares. In the anagram, for example, the constraint is to rearrange the letters of a word or phrase or text in a different way that makes another meaning: the geometry of the letters is not that important. Ambigrams are words which have the ability to be rotated but remain the same. In these, the geometry of the letters and the font used is very important as they must have the ability to be both mirrored and rotated.

Mathematical constraints are probably the most common in literature. In those there is a mathematical or geometrical law that has to be followed which determines the arrangement of words, phrases or text. The palindrome, for example,

has to follow the law of mirrored symmetry. The lipogram follows the law of subtraction as one letter, or more, deliberately is not used.

Throughout history, constraints have been widely used, often in relation to memory techniques and mnemonics, allowing readers to create a mental map where they could store and retrieve the information gained by the action of reading, in times when access to knowledge was more difficult.[296] They have been always related to the mechanisms of memory, having a strong visual impact on the memory.

In this section, I am going to examine in more detail the work of the literary group OuLiPo (1960 until now) which used constraints to create new experimental forms of literature and investigate the relation of memory, literature and space. OuLiPo reversed the relation between constraints and writing; through practising writing under constraints, they aimed to investigate how memory is facilitated by them. Instead of using constraints for remembering, they tried to examine how constraints bring forward the mechanisms of memory and how navigation in such texts by the action of reading is related to the mental topographies of the human mind. According to Peter Consenstein, literary critic, 'Components of texts such as form, architecture, meter, rhyme and narrative scheme ignite the process of remembering as much as, if not more than content.'[297]

If the above is true for literature, isn't it also true for architecture? Is it possible to examine how 'components' of buildings such as form, architecture, meter, rhythm and narrative scheme 'ignite the process of remembering', and even possibly more than 'content'? Is it possible that similar non-linear 'narrative schemes', which have recently been applied to architecture, as in *Parc de La Villette* (competition

[296] Yates, *The Art of Memory*.
[297] Peter Consenstein, *Literary Memory, Consciousness, and the Group OuLiPo* (Amsterdam and New York: Rodopi, 2002), p.15.

made in 1982) in Paris by Bernard Tschumi, have also redefined its relation to the user and probably the experience and remembrance of space?

It is not a coincidence that OuLiPo and especially Perec became interested in architecture, the city and how they are experienced by the individual and remembered. Memory is generated by the experience of space and it is memory that creates a mental topography that humans rely upon to orientate themselves throughout life. And OuLiPians found in constraints a tool to investigate those relations.

We will examine three of Perec's projects – *Grande Palindrome* (1969), *Life A Users Manual* (1978), the and *Le Lieux* (not finished) – in an attempt to find relations between constrained writing and the experience of space through the perception and memory of it. Perec's work is of great interest among architects and his way of looking at the city and space in general has been influential; for example, in 2001, *AA Files* devoted a special issue solely to Perec.[298] Not only did he relate the experience of the city to memories of it but he also showed that the role of the observer, and his or her individuality, is responsible for a countless diversity of spaces contained in other spaces.[299] In his books Perec used many different types of constraints, together with architecture and the descriptions of the city, to construct his literary structures.

Time was one of OuLiPo's main concerns. In some cases the reader becomes a part of the narrative and time is no longer linear. The reader is guided through structures where subjective images appear again and again in order for the plot to be unfolded. Memory has to be actively generated by the reader, who has to draw back and forth inside the narrative, making personal correlations and recollections, and the plot is in a stage of constant becoming. Take, for example, Calvino's *If on a Winter's*

[298] *AA Files* special issue on Perec: *AA Files*, 45–46 (2001).
[299] Georges Perec, *Species of Spaces and Other Spaces* (Penguin Books, 1997).

Night a Traveler,[300] where the reader becomes one of the main characters of the book. The book is written again with the use of a variety of constraints. It counts as one of the big achievements of the group OuLiPo. Consestein, using this book as an example and quoting Calvino, gives a useful description of how the mechanism of a constraint or permutation works in relation to the reader:

> Calvino offers what he terms a writer's '*combinatorial mechanism*' as a way of contending with the literary past and participating in the Barthesian notion of the signifying game. In the mechanism's search for the '*new*', a permutation '*clicks*', and then a shock '*occurs*'. On the one hand, the '*shock*' takes the form of a text that becomes '*charged with an unexpected meaning or unforeseen effect which the conscious mind would not have arrived at deliberately: an unconscious meaning*'. On the other hand, the '*shock*' will <u>not</u> occur if the writer is not '*surrounded by the hidden ghosts of the individual and of his society*'. The shock is the product of willful and conscious memory. Even after the '*click*' and the '*shock*', the process of evolution is far from finished because '*once we have dismantled and reassembled the process of literary composition the decisive moment of literary life will be that of reading*' and only then *'the work will continue to be born, to be judged, to be destroyed or constantly renewed on contact with the eye of the reader*'.[emphasis by author][301]

This 'shock' is what makes the opening to the poetic space hidden in the anagram, the space occupying the breaking down of the one-way relation between sign and signifier, according to Baudrillard,[302] a space of non-linear relation between reality, memory and time. This is the same space where meaning is consumed, where the 'work' is being 'destroyed or constantly renewed on contact with the eye' in the backwards palindromic movement, provoking the dream and related to the idea of 'economy' in the production of literature.

The group OuLiPo was formed by Queneau as a result of his collaboration with the mathematician Le Lionnais, when he was 'struggling with a literary task of immense complexity, his 100,000,000,000,000 poems (fig. 95). While they were

[300] Italo Calvino, *If on a Winter's Night a Traveler* (New York: Harcourt Brace Jovanovitch, 1981).
[301] Consenstein, *Literary Memory, Consciousness, and the Group OuLiPo,* p. 91.
[302] Baudrillard, *Symbolic Exchange and Death*.

resolving the problems at hand, their conversations turned to the possibility of incorporating mathematical structures into the process of literary creation.'[303] This project is a remarkable example of writing under constraint. Queneau produced a number of sonnets whose lines can be reshuffled with 100,000,000,000,000 combinations producing new sonnets and enough reading material for millions of years. According to the foreword of his English translation, 'readers wishing to do their bit consciously as active co-creators may not be content merely to ply a knitting between the strips, preferring first to memorise the poems in their entirety and only then to start permutating, truly ad lib'.[304] Queneau gives a meter for the quantitive enormity of human memory, where only ten poems are able to create a mental landscape vast enough for someone to wander in for million of years, much longer than one's physical existence. In the preface the poet himself calculates the time a close reading demands; if one reads a sonnet per minute, eight hours a day, two hundred days per year, it would take more than a million centuries to finish. The 'quantity of the text is far greater than what man has ever written since the innovation of writing, including popular novels, business letters, diplomatic correspondence, private mail, rough drafts thrown into the wastebasket, and graffiti'.[305] The layout of the book is also remarkable because all the pages are cut into strips where someone turns over the lines of the text. A copy of the English translation with the same layout exists in the British Library. With this poem-structure Queneau suggested a new kind of space not only on the book or the page but also in someone's memory. Inverted and fragmented, the linearity of the procedure of reading – together with the fragmented linearity of the structure of a book – proposes a literal and mnemonic process in a

[303] Italo Calvino, Raymond Queneau, Paul Fournel, Claude Berge, Jacques Jouet and Harry Mathews, *OuLiPo Laboratory, Texts from the Biblioteque OuLiPiene* (Bath Press, 1995), p. ix.
[304] Raymond Queneau, *100.000.000.000.000 Poems* (Paris: Kickshaws, 1983), p. 6.
[305] Warren F. Jr. Motte, ed., *OuLiPo: A Primer of Potential Literature* (Lincoln, NE and London: University of Nebraska Press, 1986).

totally different time, resembling more the abstract conception of time in mathematics. Attempts to read those sonnets, which are considered as an early example of hyper-text, involved the writing of special computer software[306] and the construction of a reading machine by Jean-Michel Bragard. Queneau's project brought the physical book to its limits.

Figure 95 Raymond Queneau's book, *Cent mille milliards de poèmes.* From *http://www.arpla.fr.*

[306] Sites where all of those poems can be read include: http://www.smullyan.org/smulloni/queneau/, http://develop.www.umich.edu/luriea-bin/queneau, http://www.wordengineering.net/ticker2.html (accessed 20 March 2005).

Constraints in the Work of Georges Perec

Constraints in the form of devices as lipograms, palindromes and mathematical space underlined the biggest part of Georges Perec's literary production. According to David Bellos, his translator and biographer, it is likely that Perec was introduced to the idea of constraint when he travelled to Serbia and by his circle of Serbian intellectuals,[307] at a very early stage of his career when he was struggling to determine his position as a writer. Perec's interest in memory was probably initiated by his difficult childhood and by losing his parents at a very young age during the Second World War.[308] Trying to find his identity, he had to go back to the earliest memories of his life, to his childhood places, and that is probably the reason why an autobiographical approach to literature (like his book *W, or a Memory of a Childhood*), together with the tools of constraints, characterised most of his writing.

Regardless of the reason for Perec's interest in those structures – either an attempt to liberate his creativity or their relation to memory, tradition and writing techniques of the middle ages – he was introduced to OuLiPo, which was already practising similar linguistic experiments. Writing under constraint seems to have become an obsession for Perec, and he constructed word puzzles for his own amusement or for his friends.

[307] 'Vidovic who first introduced Perec to the notion that the freedom to create was the fruit of tradition, and of constraint.' Ibid., p. 165.
[308] For more information on Perec see Bellos' biography: David Bellos, *Georges Perec: A Life in Words* (London: Harvill, 1993).

One of his first achievements in writing under constraint was his book *La Disparition* (1969).[309] He wrote a whole novel without using the vowel *e*, the most common letter in French literature. He tried to investigate 'if e-less French could invent its own story'.[310] This novel is a detective story, and apart from the search for the one who committed the crime there is also a research for the missing vowel, 'in a world destabilised by the removal of a mere nothing, a letter shape, an empty symbol, death issues',[311] a statement which reminds us once more of Baudrillard's *Extermination of the name of God* in the structure of the anagram. It seems that while writing, Perec was in a creative frenzy: 'I [Perec] was in a state of jubilation from the start. I felt I was a bricklayer, like someone who puts down a brick, and step by step makes a house.'[312] He had to create his own dictionary for this purpose, and it is said that he had the letter *e* tied down on his typewriter.

Perec compares the process of writing under constraint to the creation of a house, which is reminiscent of mnemonics and the comparisons made between triangular architectural forms and symmetries in the text. Language here encounters its materiality; letters are more than just carriers of signifiers and their geometry – or absence of geometry – is the program that runs the whole structure as well as the subject of the novel. Perec is also the first to write a history of the lipogram, and was researching the hidden values of language and letters themselves. According to him: 'The book is an infinite network constantly traversed by Meaning; The Spirit merges with the Letter; the Secret (Knowledge, Wisdom) is a hidden letter, an unspoken word: the book is a cryptogram whose code is the Alphabet.'[313]

---

[309] Translated into English by Gilbert Adair with the title *A Void*: Georges Perec, *A Void* (London: Harvill, 1994).
[310] Bellos, *Georges Perec*, p. 401.
[311] Ibid.
[312] Ibid., p. 399.
[313] Perec, 'History of the Lipogram', in *OuLiPo a Primer of Potential Literature*, p. 97.

... Saisi par l'inspiration, il composa illico un lai, qui, suivant la tradition du Canticum Canticorum Salomonis, magnifiait l'illuminant corps d'Anastasia:
Ton corps, un grand galion où j'irai au long-cours, un sloop, un brigantin tanguant sous mon roulis,
Ton front, un fort dont j'irai à l'assaut, un bastion, un glacis qui fondra sous l'aquilon du transport qui m'agit,
Ton pavillon auditif, un cardium, un naissain, un circinal volubilis dont j'irai suivant la circonvolution,Ton cil, la vibration d'un clin, la nictation d'un instant,Ton sourcil, l'arc triomphal sous qui j'irai m'abymant au plus profond du puits de ton cristallin noir,
Ton palais, madrigal balbutiant, atoll, corail purpurin pour qui j'irai m'asphyxiant au fond du flot,
Ton cou, donjon lilial, Kasbah du talc, parangon du tribart, carcan pour ma strangulation,
Ton bras, pavois, palan, jalon d'amour, airain poignant, torsion du garrot où s'assouvira ma pulsion,Ta main, animal aux cinq doigts, sampan, skiff, doris, ponton, louvoyant, bourlinguant, drossant au hasard sur nos corps alanguis,
Ton dos, littoral, alluvions, marais salants, lit aplani, vallon bombant, arc s'incurvant sous l'aiguillon du plaisir,
Ta chair, O chair, galuchat blanc du cachalot fatal, chagrin dont la disparition garantira ma mort, cuir où, jusqu'à la fin, j'irai gravant ton nom,
Ton flanc, ru fluvial, maillon vacillant, bord où d'abord j'irai accostant, port initial du brûlot qui m'assouvit,
Ton nombril, kaolin disjoint à jamais, hanap à jamais s'offrant aux libations,
Ton giron, blason d'un armorial inconnu, ombilic obscur, huis dont j'ouvrirai l'ajourant tourillon,
Ton cul, fruit dont j'irai gaulant l'incapsulant noyau, pignon charnu, grapillon côtissant,
Ta toison, Toison d'or pour qui, à l'instar d'un Jason, j'allai, vingt ans durant, bravant l'ouragan, ta toison, divin pubis, sourcils d'amour, rachis, tuyaux, canons, poils, plumial à qui j'offrirai un calmar, marabout, paradis d'un pays conquis,
Ton sillon, ton sillon lotus, ton sillon oubli, où tout disparaît, où tout s'abolit, ton sillon Nirvâna, ton sillon où à jamais mordra ma mort, où j'irai à jamais naissant, à jamais mourant, agonisant d'un trop humain plaisir,
Ton bouton, où tout va mourir, ton bouton, bastion final où j'irai m'annulant, où j'irai m'absorbant, m'abolissant dans un amour toujours à accomplir, dans l'absolu sursaut où nous vivrons un jour, confondus à jamais, dans la passion ou dans l'oubli, dans la nuit où tout disparaît, dans l'infini instant où nous n'aurons qu'un corps !

Figure 96 Georges Perec, *La disparition,* Paris, 1969.

Le Grande Palindrome

The *Grande Palindrome*, written by Perec in 1969, was a similar undertaking. Bellos, describing Perec's effort of writing this palindrome, gives a sense of the text's density: 'The constraint tightens not in arithmetical proportion to the length, but rather arithmetically, logarithmically, exponentially, or perhaps even asymptotically, for every letter that is added to a text that must be readable both forwards and in reverse forces a reconfiguration of the whole.'[314] It is one of the longest palindromes ever written, comprising 5,566 letters or 6,372 characters. It is not a perfect palindrome as it is different in its backward movement, narrating two different stories in each of the two possible movements inside it. The reader, in his journey through this palindrome, is about to meet many of the heroes of childhood: Hercules, Samson, historical personalities related to the revolution like Che Guevara, protagonists in myths and imaginary creatures like Aladdin, Ali Baba, Daidalus, Narcissus, Orpheus, Arsinoe, Adam, Phoenix, Mermaids, Sirens and persons related to mysticism such as Lucifer, Beelzebub, Nostradamus, Zarathustra. It is as if by writing a very difficult-to-read text Perec is trying to transfer the reader to the world of memory and myth. The meaning of the text is being produced in a surrealistic kind of way and all these mythical features and names reflect like echoes when the text is read silently or loud. This process suggests that someone has to be released from the traditional linear procedure of reading and understanding and wander to the world of dream and memory.

From the very beginning Perec gives directions on how to deal with the text. The text starts with the words 'Trace l'inégal palindrome …' (trace the uneven palindrome …), suggesting that there is no fixed route, but instead you have to move

[314] Bellos, *Georges Perec*, p. 428.

inside the text by tracing it, as you trace your path in an unfamiliar landscape, real or imagined. Each reader has to find an individual way, and one could only manage it by walking in the streets of personal memory, meeting the fantastic creatures of myth and the heroes of childhood. Perec suggests that to travel in this palindromic world you have to grope along, reflecting yourself onto the text and onto the images of your memory. And no one will follow the same route, because the path is 'uneven' (inégal), because everyone's memory is different, as the palindrome is different in its backwards movement.

A small translation of the beginning and end of the *Le Grande Palindrome* (taken from Bellos's *Georges Perec: A Life in Words*)[315] demonstrates the two different routes or stories someone can follow inside the text:

TRACELINEGALPALINDROME NEIGEBAGATELLEDIRAHERCU LELEBRUTREPENTIRCETECRIT NEPERECLARCLUPESETROPLI SAVICEVERSAPERTECERISED	DESIRECETREPASREVECIVASI LPORTESEPULCRALCEREPENT IRCETECRITNEPERTURBELELU CREHARIDELLETAGABAGIENE MORDNILAPLAGENILECART
Trace l'inegal palindrome. Neige. Bagatelle, dira Hercule. Le brut repentir, cet ecrit ne Perec. L'arc lu pese trop, lis a vice-versa. Perte. Cerise d …	Desire ce trepas reve: Ci va ! S'il porte, sepulcral, ce repentir, cet ecrit ne perturbe le lucre: Haridelle, ta gabegie ne mord ni la plage ni l'ecart.
Trace the uneven palindrome. Snow. A trifle, says Hercules. Unadorned repentance, this piece born [of] Perec. [If] the bow of reading is too heavy, read back to front. Loss. Cherry …	Desire this dreamt-of death: Here goes! If it bears, entombed, this repentance, this writing bears not on lucre. Strumpet, your trickery has no bite on range or space!

In the original version of the text the 'two extrapolations' of the text (in the two different directions), are separated by three points of suspension […]. According to Perec those 'do not constitute a poem in themselves; they are the centre of the void, the gap between the two texts that mirror each other […] It is to that extent only that

[315] Ibid., p. 430.

their poetic virtue seems to me to be certain.'[316] These points we could claim become the centre of the whirlpool, similar to Camillo's *artificial wheel* or Mallarmé's image of the whirlpool in *Un Coup de Dés*.

Language is very important in writing a palindrome. It is not only that its composition demands an extremely good knowledge of language and a very imaginative use of it, but palindromes are also impossible to translate, as such a thing would radically change the structure of the text. The translation reproduced above is based only in content and meaning and not on the text's form, as the new text is not anymore a palindrome. In this sense, palindromes constitute site-specific writings, as their site is not only the boundaries of the page but also the boundaries of the country where they were produced or the people who speak the language.

[316] Ibid., p. 429.

Life A User's Manual

In his best-known book, *Life A User's Manual* (1978),[317] Perec once more used specific constraints as the basis of its structure. In fact, in this work he used a wide variety of constraints, combining them all in a very well-organised mechanism which he deliberately hides at the end. When Perec was describing his plan for a new novel in a meeting of OuLiPo, he described the constraints as:

> A plan for a novel in semantic Oulipian mode:
> Knights tour on a ten square board
> Latin bi- square of order 10
> False dixain
> Description of a painting: a house with the façade removed.
> Ten floors, ten rooms per floor.[318]

All the above constraints combine at the end to create a block of flats and describe the life of its inhabitants.

The 10 × 10 bi-Latin squares are one of the main constraints Perec used for his book. Bi-Latin squares are very difficult to construct, especially those of 6 × 6 or 12 × 12 (he was planning to use a 12 × 12 bi-Latin square for *Lieux*). Latin squares are grids $n \times n$, where someone can arrange numbers, words or other symbols in such a way that each of them appears once on each column and each row. One of the values of the bi-Latin squares is that when two of them are superimposed, they produce a new one, which contains all the possible combinations of the first ones,[319] without the same couple ever occurring twice. Perec 'for every chapter listed 42 themes that must

[317] Perec was very specific for the title that he didn't want to separate the words with a comma and that the A should be a capital letter.
[318] Bellos, *Georges Perec*, p. 508.
[319] According to Dr Leonidas Pitsoulis, Professor of Mathematics at the Aristotle University of Thessaloniki.

appear in it';[320] these themes included objects, quotations, actions and characters, and the 10 × 10 bi-Latin square was the decisive tool of their distribution.

> [Perec] in the end, … employed twenty-one bi-squares, each comprising two lists of 10 'elements', giving forty-two lists in all, with 420 'things' to distribute, forty-two to a box (and never the same 42 twice). With so much of his material predetermined – the place of each chapter in the novel's sequence, the place of each room described in the block of flats, and forty-two things to say about every room – surely the book would just write itself.[321]

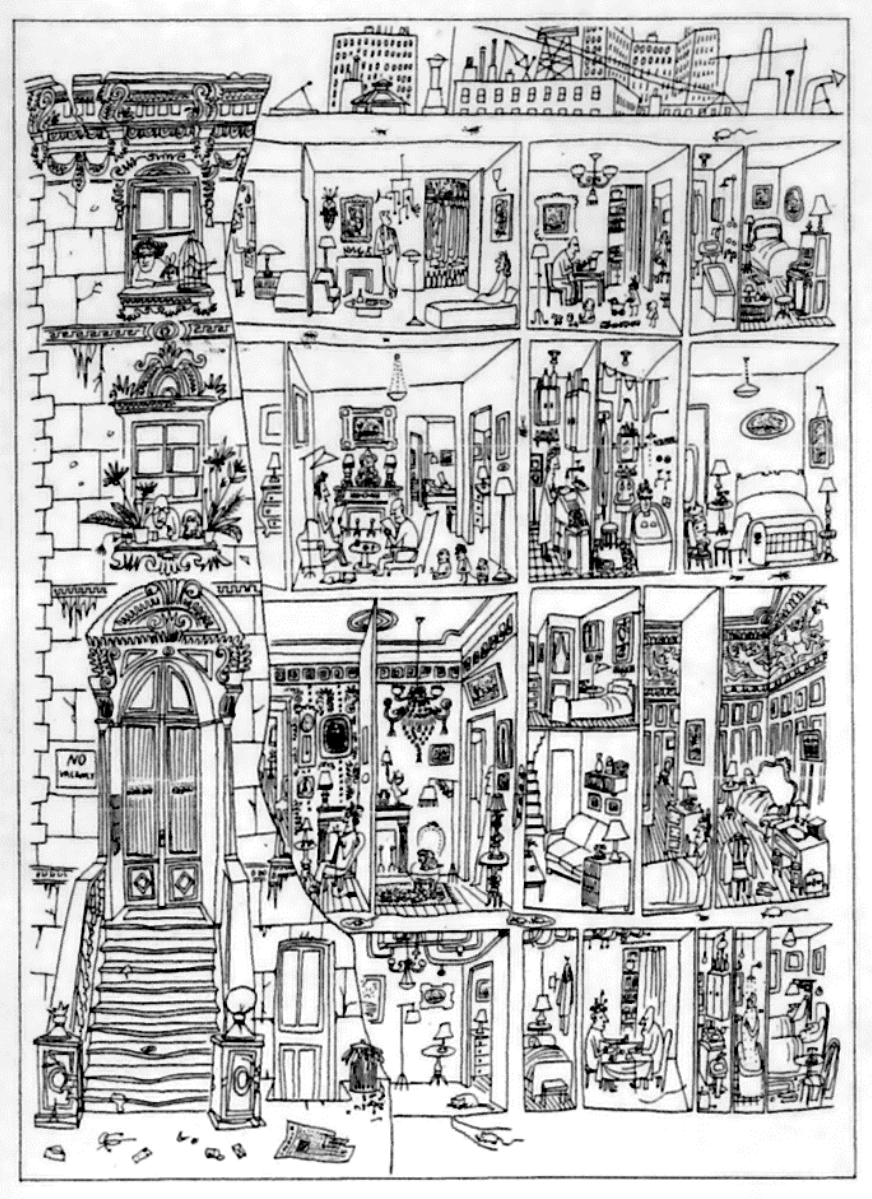


Figure 97 Saul Steinberg, *No Vacancy*, the drawing that provided one of Perec's constraints for *Life A User's Manual*. From *The Art of Living*, New York, 1949.

[320] Harry Mathews and Alastair Brotchie, *OuLiPo Compendium* (London: Atlas Press, 2005), p. 172.
[321] Bellos, *Georges Perec*, p. 515.

The following two tables show the 'list of lists' and the 'list of Couples', the subjects Perec decided to distribute within the superimposed bi-Latin squares and with which he occupied the spaces of the grid created by the squares:

1. Position 2. Activity 3. Quotations 1 4. Quotations 2 **1**	21. Fabrics 22. Colours 23. Accessories 24. Jewels **6**
5. Number 6. Role 7. Third Sector 8. Motive? **2**	25. Reading 26. Music 27. Pictures 28. Books **7**
9. Walls 10. Floors 11. Period 12. Place **3**	29. Drink 30. Food 31. Small furniture 32. Toys **8**
13. Style 14. Furniture 15. Length 16. Miscellaneous **4**	33. Feelings 34. Paint 35. Surfaces 36. Volumes **9**
17. Age/Sex 18. Animals 19. Clothes 20. Fabrics **5**	37. Flowers 38. Trinkets 39. *Manque* 40. *Faux* **10**
41. Couple 1	42. Couple 2

List of Lists of *Life A User's Manual*. From David Bellos, *Georges Perec*, London, 1993.

	List 41		List 42
1	Laurel	and	Hardy
2	Sickle	and	Hammer
3	Racine	and	Shakespeare
4	Philemon	and	Baucis
5	Crime	and	Punishment
6	Pride	and	Prejudice
7	Night	and	Fog
8	Ashes	and	Diamonds
9	Arable	and	Livestock
0	Beauty	and the	Beast

'Couples' Lists of *Life A User's Manual*. From David Bellos, *Georges Perec*, London, 1993.

After Perec decided how and what to talk about in his chapters he had to choose how to link between the chapters. The solution to the problem of moving from chapter to chapter or from space to space was again given by a different constraint:

> It would have been tedious to describe the building floor by floor and apartment by apartment; but that was no reason to leave the chapter sequence to chance. So I decided to use a principle derived from an old problem well known to chess enthusiasts and known as the Knight's tour; it requires moving a knight around the 64 squares of a chess-board without its ever landing more than once on the same square. Thousands of solutions exist, of which some, like Euler's, also form magic squares. For the special case of *Life A User's Manual*, a solution for a 10 × 10 chess-board had to be found; I managed this miraculously, by trial and error. The division of the book into six parts was derived from the same principle: each time the knight has finished touching all four sides of the square, a new section begins.[322]

	1	2	3	4	5	6	7	8	9	0
1	59	83	15	10	57	48	7	52	45	54
2	97	11	58	82	16	9	46	55	6	51
3	84	60	96	14	47	56	49	8	53	44
4	12	98	81	86	95	17	28	43	50	5
5	61	85	13	18	27	79	94	4	41	30
6	99	70	26	80	87	♞	42	29	93	3
7	25	62	88	69	19	36	78	2	31	40
8	71	65	20	23	89	68	34	37	77	92
9	63	24	66	73	35	22	90	75	39	32
0		72	64	21	67	74	38	33	91	76

Figure 98 Arrangement of chapters in *Life A User's Manual*. From Harry Mathews and Alastair Brotchie, *OuLiPo Compendium*, London, 2005.

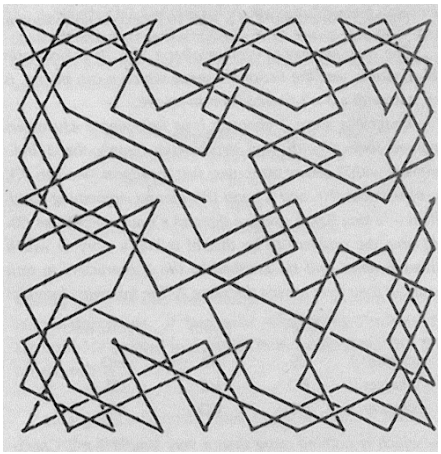


Figure 99 Knight's movement from chapter to chapter in *Life A User's Manual*. From Harry Mathews and Alastair Brotchie, *OuLiPo Compendium*, London, 2005.

The knight's move inside the text (fig. 99) is a familiar anagrammatic technique used to encrypt meaning. But Bergerson also compares the palindrome's composition to the game of chess, declaring that palindromes are a 'literary chess' where 'Devil plays the Whites'. In contrast to the existing belief that no 'worthwhile

[322] Perec quoted in Mathews and Brotchie, *OuLiPo Compendium*, p. 171.

literary creation can be made this way' (i.e. the palindromic way), Bergerson used the art of chess to justify the artistic qualities of palindromic poetry.[323] In Bergerson's case, the chess does not act as language's spatial metaphor but as a combinatorial creative procedure which releases the mind to links and interrelations not achievable otherwise. In *Life A User's Manual*, the Knight's move constraint seems to operate as both a spatial distribution of events in the book and an operation for liberating the writer's imagination. But there is a basic distinction. Perec did not hide the 'name of God', as was the case with most anagrammatic poetry, but fragmented and scattered the stories and events of the lives of ordinary people. His literary mnemonic space is not inhibited by divine presence but by the ordinariness and splendour of everyday existence, elevating life as the highest mystical experience.

Constraints predetermined everything and there was nothing left to Perec other than the almost mechanical procedure of writing. It is striking that the book was written and ready for publishing in a very short time. According to Perec, it was as if the book was writing itself. After the completion of the book the whole mechanism of the constraints became unrecognisable. The synthesis of all the above is a manifestation of the imaginative power of the author and his mastery in using the constraints he imposed on himself. Unlike other examples written with constraints, this book is not difficult to read and his building could easily be somewhere in Paris, probably one of the early examples of French blocks of flats, making it very difficult for the unaware reader to perceive this building as a fictional construction. On the other hand we can witness the liberation of the imagination by the application of such a dense system of constraints.

[323] 'Nicely combined as palindromes, poetry and chess should pulse with a hybrid élan unknown to either of them taken alone.' Howard W. Bergerson, *Palindromes and Anagrams* (New York: Dover Publications, 1973), pp. 1–2.

The next is a conceptual drawing of how Perec superimposed his three basic constraints to create the space of the book:

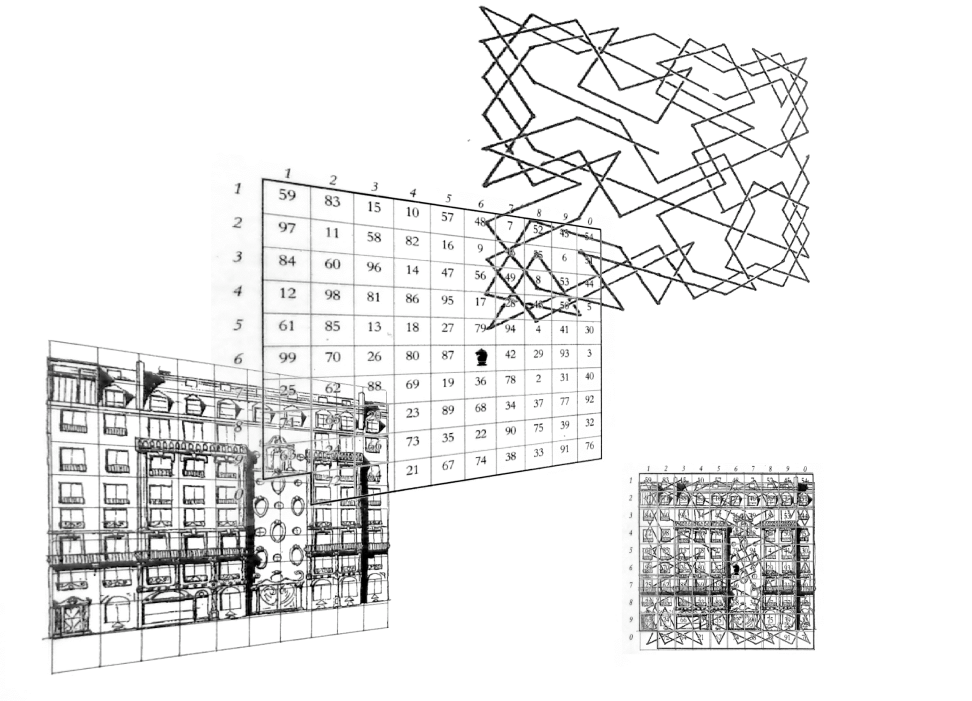


Figure 100 The three main constraints of *Life A User's Manual*: the façade of a Parisian building, bi-Latin squares and the Knight's move. On the right side, how the three systems combine together. Produced by author.

The way these three systems – the façade of the building, the bi-Latin squares and the Knight's move – are superimposed to produce the space of the book (fig. 100) has a striking similarity to Tschumi's conceptual drawing of *La Villette* (competition made in 1982) for the production of the architectural space (fig. 101). Like Perec, Tschumi superimposed three different systems to distribute actions, movements and planes. Here space is organised by superimposing three different systems of layers: surfaces, movements or routes, and a grid of follies which are decorative buildings without purpose. The whole project could be seen as an illustration of a book in space, where surfaces are the pages, follies the letters and their arrangement on the page and routes represent the action and movement through the pages of the reader, who reads the

letters and creates meaning. These three systems over-layered create the space of *La Villette*, as they would create the space of a book.

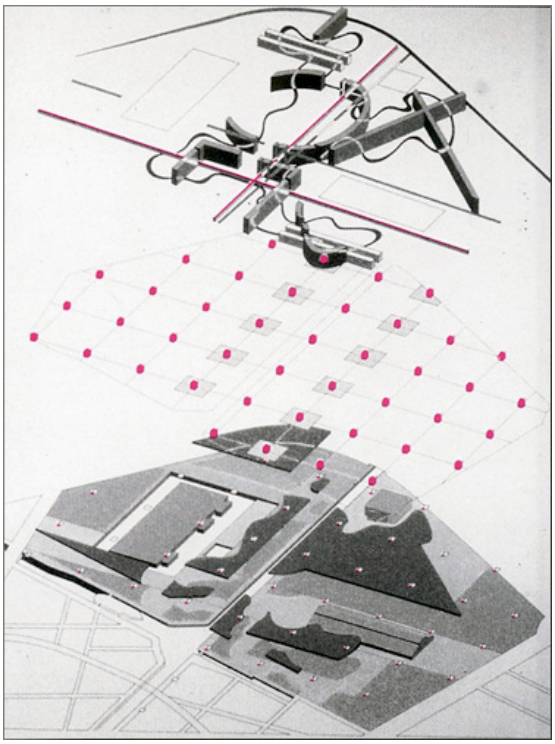


Figure 101 Bernard Tschumi, conceptual drawing of *Parc de la Villette,* 1982. From Giovanni Damiani, *Bernard Tschumi*, London 2003.

Another main constraint of *Life A User's Manual* is the palindromic story of Bartlebooth, one of the central characters of the book. In Bartlebooth's case, life itself becomes the constraint.[324] Bartlebooth, rich and uninterested in anything, decides to live his life under a very firm programme. At first he takes twenty years to learn painting, then for another twenty years he travels the world painting waterscapes, which then he sends back to Paris to be dismantled into jigsaw puzzles. Bartlebooth spends the last part of his life solving the puzzles, which he then sends back to the

[324] 1969 was the year of the completion of the *Grande Palindrome*. The study of the structure of the palindrome was probably the inspiration for transferring the same structure into someone's real life. According to David Bellos, 'Perec had something called the "Bartlebooth synopsis" in his mind since 1969, if not earlier.' Bellos, *Georges Perec*, p. 513.

places where they have been painted. In those places the images were erased, leaving at the end nothing but empty paper. According to Perec the whole plan:

> …came to rest on three guiding principles.
> The first was moral: the plan should not have to do with an exploit or record, it would be neither a peak to scale nor an ocean floor to search. What Bartlebooth would do would not be heroic, or spectacular; it would be something simple and discreet, difficult of course but not impossibly so, controlled from the start to finish and conversely controlling every detail of the life of the man engaged upon it.
> The second was logical: all recourse to chance would be ruled out, and the point would make time and space serve as the abstract coordinates plotting the ineluctable recursion of the identical events occurring inexorably in their allotted places, on their allotted dates.
> The third was aesthetic: the plan would be useless, since gratuitousness was the sole guarantor of its rigour, and would destroy itself as it proceeded; its perfection would be circular: a series of events which when concatenated nullify each other: starting from nothing, passing through precise operations on finished objects, Bartlebooth would end up with nothing.[325]

In the above description, Perec gives the moral, logical and aesthetic values of a palindrome providing also another interpretation to the palindromic values of *reversibility*, *mirror symmetry* and *cancelation of meaning*, as examined in the *definition of the palindrome*. Bartlebooth's life was determined to form a perfect circle arriving at nothing through 'precise transformations of finite objects',[326] just as in palindromes where the cancellation of meaning takes place through transformations of their distinct elements, the letters. Bartlebooth's life is characterised by a reflective symmetry, which ends in nothing, and probably the greatness of his plan was that it was perfect. In the 1988 Collins Harvill edition of *Life A User's Manual*, the book itself reflects the above palindromic qualities of Bartlebooth's story. It is divided into two parts each one consisting of three chapters and flips over in the middle. The two directions of reading meet at the centre of the book, which is the palindromic page

[325] Georges Perec, *Life A User's Manual*, trans. David Bellos (London: Collins Harvill, 1988), p. 118.
[326] According to a different translation by Peter Consestein: 'Starting at nothing it would arrive at nothing thus forming a perfect circle (zero) through "*the precise transformations of finite object*".' Consenstein, *Literary Memory, Consciousness, and the Group OuLiPo*, p. 65.

303. If this is a coincidence it is surely an interesting one as page 303 reflects also the structure of this particular edition in which three chapters → (towards right) and three chapters ← (towards left), lead to nothing (zero). The beginning, the middle and the end of this edition are marked with an image of a staircase and the book is accompanied with a box containing a jigsaw puzzle with a watercolour image of the title and author. Perec at the end of *Life A User's Manual* breaks this perfect symmetry with Bartlebooth not able to finish all the puzzles, his plan unaccomplished, and with the last piece of the puzzle not fitting. This is the principle of the 'clinamen'. Members of OuLiPo believed that every constraint had to have a deviation. 'Without the deviation there is only a recursive and inescapable loop',[327] and the clinamen is what breaks up the symmetry at the end, generating Life. Perec seems to claim that Bartlebooth invented such a perfect plan that if it was completed his character would fall to an endless repetition of successive circles, or to immortality similar to Nietzsche's eternal recurrence of the same. But Life is not like that, and there is no such thing as a perfect image or a perfect reflection. The clinamen is what makes the difference between constraint and reality.

How the book was structured recalls 'architectural mnemonics',[328] based on medieval mnemotechniques. According to Carruthers:

> Quintilian speaks both of memorising a text in (numerical) order, and of marking the passages one particularly wants or needs to remember with mental *notae*. *Notae* are discussed twice in relation to memory training. First describing the system of *loci* and *imagines*, Quintilian suggests imprinting in orderly progression a spacious house with many rooms, and then marking the items to be remembered by a *notae*, either an associate sign (an anchor to remind one of navigation for instance) or a key-word, 'for what is slipping from the memory is recovered by admonition of a single word' … these *notae* are then placed in the orderly series of rooms.[329]

[327] Ibid., p. 69.
[328] More details about them in: Carruthers, *The Book of Memory*.
[329] Ibid., p. 107.

The process described above from Carruthers echoes Perec's technique or method, but in fact Perec does the reverse. Instead of placing the 'notae' into each of the rooms or memory spaces, he already has the rooms upon which he places the 'notae', the memory's anchors. When you read the book you are unaware of the system employed by the writer but your memory is asked to reconstruct the connections, the anchored 'associate signs or key words' to the rooms or the items of the rooms, as if in a dream. Perec's long descriptions of the rooms based on completely mathematic – we could even claim Pythagorean – constraints seem to serve such a process and, like the 'cubic poetry' referenced in Vitruvius, a space is created in which the mind can dwell.

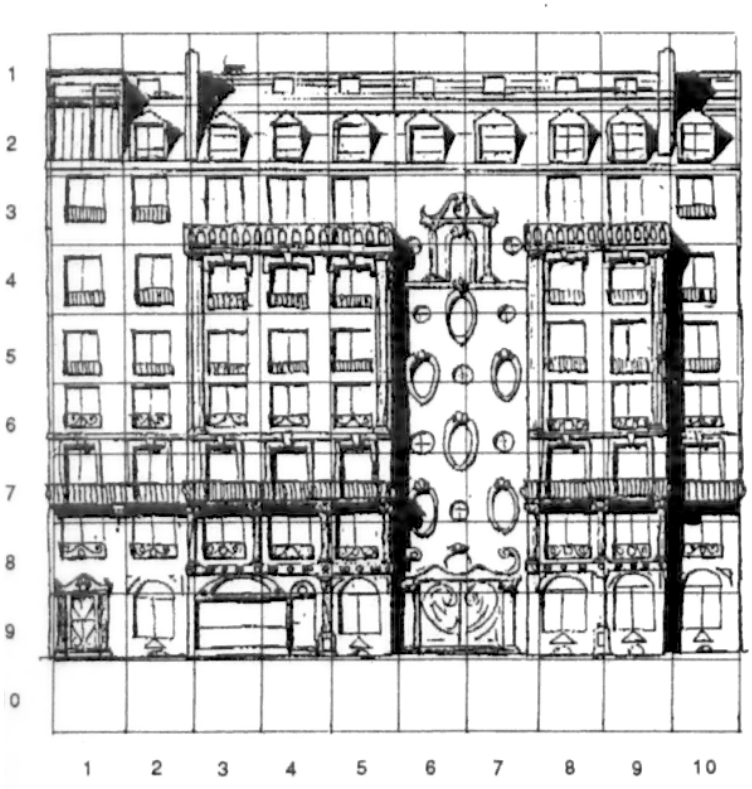


Figure 102 Conceptual drawing of *Life A User's Manual*.
From Harry Mathews and Alastair Brotchie, *OuLiPo Compendium*, London, 2005.

> By using the example of a Parisian apartment block to construct a narrative, Perec has committed a specific architectural design to memory, and after thoroughly 'digesting' his work, those apartment blocks can never look the same for the reader; their façades contain stories.[330]

If in mnemonics architecture or buildings have been used to give shape to one's individual memory, Perec used each individual's memory to create the book as a space or building. The dense scaffold made by all the various constraints is inscribed into the reader's memory and images and occupants fill in the rooms of one's mind like the composition of an imaginary puzzle. In the conceptual drawing shown above (fig. 102), we can see how Perec structured the book. In the façade of a building ten rooms high and ten rooms wide, he superimposed his 10 × 10 bi-Latin squares with the contents of the chapters.

Memory techniques rely on the creation of images by sight, their association and their order, and that is what Perec constructs in his book. Perec creates amazingly detailed descriptions of objects, interiors, relations to their owners and inhabitants of the building, and overwhelming lists. Going back to the definition and description of memory techniques, we find a possible reason for why those elements have been used so extensively. Yates, describing how those techniques were created by poet Simonides, gives a fascinating description of the process from Cicero:

> Noting that it was through his [Simonides'] memory of the places at which the guests had been sitting that he had been able to identify the bodies, he realised that orderly arrangement is essential for good memory.
> He inferred that persons to train this faculty (of memory) must select places and form mental images of the things they wish to remember and store those images in the places that will preserve the order of the things, and the images of the things will denote the things themselves, and we shall employ the places and images respectively as a wax-writing tablet and the letters written on them. (Cicero, *De oratore*, II, Ixxxvi, 351–54)[331]

[330] Consenstein, *Literary Memory, Consciousness, and the Group OuLiPo*, p. 88.
[331] Yates, *The Art of Memory*, p. 2.

The above description is not unlike Perec's use of enormous lists in *Life A User's Manual*. He first selects the rooms of the building and stores the mental images he forms into them. The order of places – the order arranged by the 10 × 10 bi-Latin square and the Knight's movement – preserves the order of things, and his lists of things then denote the things themselves, the life of the characters and Life itself. Those lists generate images, which in turn generate memory, and memory generates Life, and its Manual. It is the reverse of what Cicero suggests. It is remarkable that avant-garde or post-modern literature relates to the ancient techniques and genres that have existed since the sixth century BC. Perec places the contemporary reader in the place of the orator of the past and what once had been private memory – the memory of the orator, or in this case Perec's memory – becomes the site of literature, where the reader has to trace the hidden images. The anchor Perec uses to tie down together things and order is constraint, and the scaffold he is using is the bi-Latin square. The density of his scaffold denotes the density of memory.

'Cicero emphasises that Simonides' invention of the art of memory rested, not only on his discovery of the importance of order for memory, but also on the discovery that the sense of sight is the strongest of all the senses.'[332] This quote also explains why Perec's descriptions are almost cinematic. Sight is the most important of all the senses for the functions of memory; and in his book we see the space, and slowly we focus on the elements of space and then on the objects seen from different angles, as if we are zooming in on them. In Perec's imaginary site stories became the experience of space in time. The building started to have a life of its own and then Perec only had to note down the events as an external observer of his memory. Perec seems to be claiming that we moderns have not only lost our memories but have also

[332] Ibid., p. 4.

lost our sight, how to see things and how to observe. He is suggesting that to innovate we have to go back, and that to see we have to remember.

If Perec in *Life A User's Manual* constructs an imaginary building, investigating how space is experienced in relation to our memory, his project *Lieux* attempted to investigate the same concepts but in the urban environment. An enormous project – which recalls Mallarmé's never-realised project *Le Livre – Lieux* (not realised) was designed to last twelve years and produce 288 texts: 144 (12 × 12) 'reals' and 144 (12 × 12) 'memories', organised around a 12 × 12 grid, which he constructed again with the method of 'Sets of Mutually Orthogonal Latin Squares'.[333] Every square of the grid corresponds to a place in Paris related to his life. His aim was to describe it both by visiting and listing what he was seeing and by memory. Perec is in this case trying to superimpose reality onto memory in all of their possible combinations.

[333] Andrew Leak, 'Paris Created and Destroyed', *AA Files* 45–46 (2001): 26.

Daniel Libeskind

> [Giordano] Bruno perceived the ideal human mind as one that moved fluidly with the vicissitudes of the universe. As such, Bruno's mental universe is one that transcends the traditional constraints of time and space. To think in an 'ideal linear fashion' is to gaze, like Janus, in two directions (at least) at once.[334]

According to mythology, Janus was the divinity related to palindromes. Palindromes relate the non-linear procedures of writing to non-linear procedures of designing space; they associate the geometry of language to that of space as well the experience of time in literature and architecture. This experience of time is based on both the senses and memory. It is not the linear flow of time, outside our perception, but the experience of time in memory when we encounter literal or architectural space. Libeskind's non-linear and interdisciplinary approach to contemporary architecture utilises palindromic features – the reversibility, the consumption of meaning, the self-referential character, the non-linearity – in an attempt to link the space of text to the space of architecture. He also provides a starting point to explore how a palindromic space could be realised in architecture and with what effects on the experience of architectural space. Libeskind's examples are also important to understand why palindromes have been considered as textual machines by groups like OuLiPo and writers like Perec and to understand their mnemonic value. Using the palindrome as an analytic tool in this chapter, we will examine the possible relations between architecture and literature and compare spatial literal structures (the example of Perec) and textual architectural ones (the example of Libeskind).

Palindromes have already been analysed as spatial memory machines and *memory wheels*, creating the backward/forward experience of (dis)orientation in their

[334]. Saiber, *Giordano Bruno and the Geometry of Language*, p. 82.

structure and as non-linear, angular or reversible symmetrical patterns in the Renaissance literature and architecture; however, we find the same models in post-modern literature and design. Ideas of buildings structured by words as a text and of words as buildings are found since antiquity. Looking forward we will examine non-linear narratives in more recent architecture.

Perec and OuLiPo initiated the subject of writing-memory machines, in which mathematical and geometrical constraints were used to produce literature and stimulate memory. In architecture the tradition of memory machines goes back to the Middle Ages. We are going to examine such memory machines, focusing mostly on more recent examples.

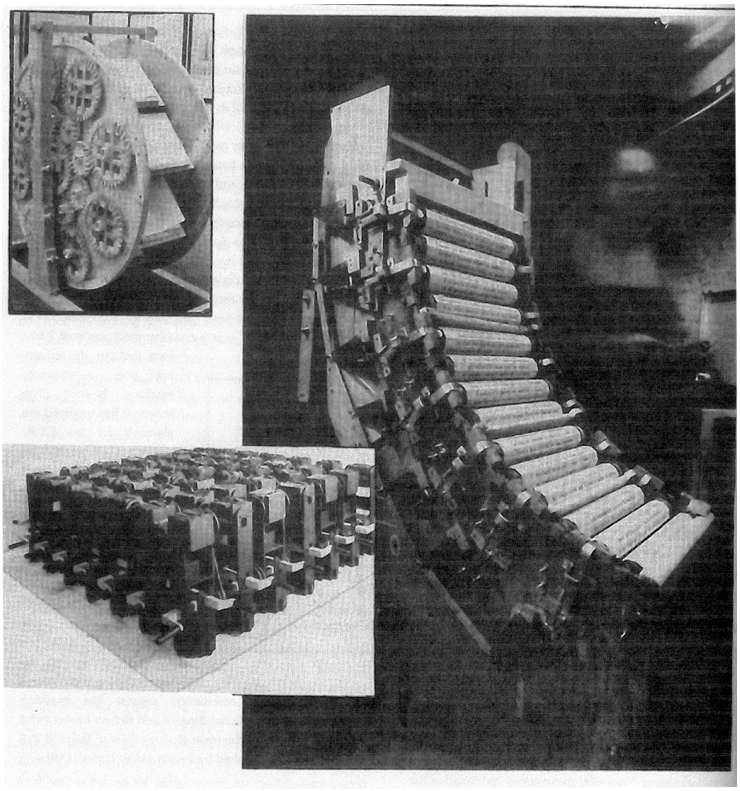


Figure 103 Jean-Michel Bragard, machine (the one on the right) for reading Queneau's poem in relation to Libeskind's machines (on the left). From Harry Mathews and Alastair Brotchie, *OuLliPo Compendium*, London 2005.

Daniel Libeskind's architectural and theoretical work demonstrates an interest in the issues of memory, remembrance and how those can be inscribed into space. Not only are most of his buildings memorials or museums but these interests are also reflected in his writings and methods of design. Libeskind is known for borrowing his compositional techniques from other fields such as literature, mathematics and music.[335]

Design, as it typically exists, for Libeskind, is most of all a narrative, 'a kind of communicative art that should tell a story', and into buildings are integrated the stories of their 'own making'.[336] Trying to assert this difference in the sphere of contemporary architecture, he turns towards other disciplines like literature, music, and history, using them as 'organizational structures'. The result is buildings 'with multiple narrations', where stories are interwoven in a spatial and temporal web of non-linear circulation inside the space of the narrative as well as of the edifice. This manifestation reminds us of the quest of post-modernist literature, where in similar non-linear narratives and textual organisational structures writers of OuLiPo, such as Perec and Calvino, tried to renovate literature and experiment with issues like those of memory and time. On the one hand we have writers trying to apply geometrical and mathematical constraints in their literature, and on the other, architects trying to apply literary narratives on the study of the geometry of representation and creation of space.

[335] Before studying architecture Libeskind was a trained musician and music theoretician.
[336] Daniel Libeskind, *Monument and Memory* (Department of Art History and Archaeology, Columbia University, 2002), p. 11.

Libeskind's project which will be examined in more detail is one he did for the Venice Biennale, entitled *Three Lessons in Architecture* (1985).[337] He designed three machines which are:

1. reading architecture, and its equivalent, the reading machine;
2. the lesson in the present remembering architecture, and the memory machine;
3. writing architecture, and its equivalent, the writing machine.[338]

Theses machines, as Libeskind claims, are three parts of the same 'movement', an answer he suggested for 'a problem in Venice'.[339] They were designed to be placed in the main square of the city of Palmanova, a city that exists in northern Italy in the region of Veneto (fig. 104). Palmanova is a fortified city settlement, built in the sixteenth century and by some attributed to Vincenzo Scamozzi (1548–1616), architect. Although it is not definite that Scamozzi designed the city, a drawing similar to the city exists in his book *L'Idea della Architettura Universale* (The Universal Idea of Architecture) (1615) (fig. 105). The design of Palmanova was an answer to the Renaissance question of the centralised town. Another example is Filarete's (1400–69) *Sforzinda*, which was never realised. Although Filarete provides a building as an answer to the centralised town,[340] Scamozzi suggests the centre is occupied by a square, piazza or empty space, where all the accesses or views end. This is where Libeskind decided to place his machines and provide his contemporary answer to the question of the centralised town, building and architecture.

[337] Daniel Libeskind, *Countersign*, *Architectural Monographs, 0141–2191; No. 16* (London: Academy Editions, 1991).
[338] Ibid., p. 38.
[339] Ibid.
[340] Cliff Moughtin, *Urban Design; Street and Square*, 3rd ed. (Amsterdam, London: Architectural Press, 2003), p. 77.

Figure 104 Palmanova in Italy. From http://www.paesionline.it.

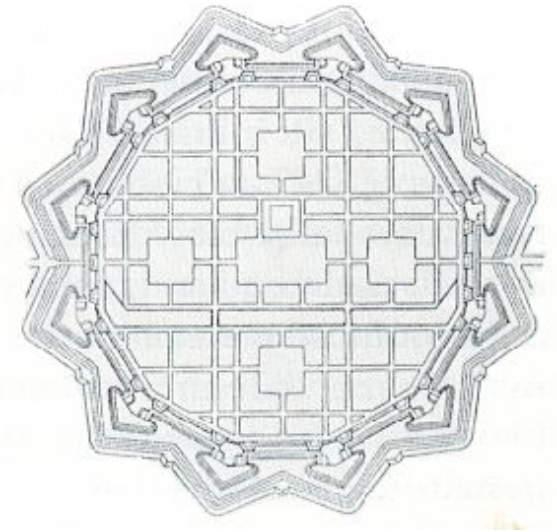


Figure 105 Vincenzo Scamozzi, drawing of centralised town, building, 1615. From *L'Idea della Architettura Universale*, Verona, 1997.

The citizens of the Palmanova, when looking for answers, could address their questions to these machines Libeskind designed. Instead of a fixed answer to a fixed programme, he suggested these machines as 'an alternative solution by exploring participatory reality and to present those who ask the question with a participatory experience in which the problem of architecture might come into focus on the one hand, and some part of it might fall into oblivion on the other'.[341] The function of these machines, as one system, is to 'destroy and obliterate' the given problem of architecture through creation ('might come into focus') or death ('might fall into oblivion'). We will examine this project as a mnemonic procedure, similar to the palindrome's, for the creation and generation or self-consumption and destruction of architecture's image.

Libeskind begins the description of this project in *The Pilgrimage of Absolute Architecture (A Conversational Explanation)*[342] with the claim 'that architecture has

[341] Libeskind, *Countersign*, p. 38.
[342] Ibid., p. 37.

entered its end. That is not to say that architecture has finished, but that architecture has entered an end condition.'[343] He envisages the end as a situation similar to Bruno's palindromic emblem *Hostis non Hostis* analysed in the introduction, or the situation where the signified/signifier relation of the architectural object is destabilised, in a way similar to that we saw with the name of God in anagrammatic poetry according to Baudrillard's analysis of the anagram. This 'end condition' is representative of our civilisation's agony in front of the realisation, for the first time, of the 'disappearance of the end'. Up to now immortality – as a condition *after* the end – was conceived either as 'a region of the beyond, an immortality *yet* to *come*' or as Nietzsche's recurrence of the Same in the infinity of time. According to Baudrillard, our civilisation has reached a stage where immortality 'incorporates the recession of outcomes *ad infinitum'*.[344] In that sense the end is encountered as a creative condition, a condition of immortality, which generates an opening to a different kind of space. In Libeskind's drawings,[345] the 'end of architecture' – destabilising the architectural signified/signifier linearity – 'opens up a view of a realm in which signs compose a score of spatial music'.[346] In the machines he proposed for the Biennale exhibition, Libeskind is interested in this kind of fluid, ever-changing space, looking at the same time for a method for its production.

---

[343] Ibid., p. 38.

[344] 'The fact that we are entering on a retroactive form of history, that all our ideas, philosophies, mental faculties are progressively adapting themselves to this model, is quite evident. This may just as well be an adventure, since the disappearance of the end is, in itself, an original or creative situation. It seems to be characteristic of our culture and our history, which have no end in sight either as guarantors of an indefinite recurrence, or of an immortality pursued in the opposite direction. Up til now, immortality was conceived of as a region of the beyond, an immortality *yet to come*; today however, we have concocted another type of immortality, one on *this side of the fence* that incorporates the recession of outcomes *ad infinitum*.' Baudrillard, *Hystericizing the Millennium*.

[345] Daniel Libeskind and Peter Eisenman, *Chamber Works: Architectural Meditations on Themes from Heraclitus* (London: The Architectural Association, 1983).

[346] Kurt W. Forster, commenting on Libeskind's drawings in *Chamber Works: Architectural Meditations on Themes from Heraclitus*, states: 'Daniel Libeskind's suite of twenty-eight drawings recovers the sphere of imaginative transcription and, in the process, opens up an unblinkered view of a realm in which signs compose a score of spatial music.' Ibid., p. 9.

Libeskind encounters the so far unattained equilibrium in the world as 'a shape of space … which on a permanent basis produces a destabilised – let's say an eternal – movement of imperfection and difference'.[347] This 'eternal movement of difference' has the ability to generate architectural form, 'shape of space', and these three machines act as procedure of the self-creation or self-generation of form and space in a mechanical sense. Every form produced is destabilised and consumed by its own image like Narcissus, giving or opening space for the formation of a new one. The first machine refers to the space of reading, the second to the invisible space of memory's topology and the third to the space of writing architecture. Unsatisfied by the potentiality of the existing language as 'no language has been upon which to discuss such phenomenon',[348] Libeskind decides to use the anagram as a new vocabulary and the linguistic force that generates those machines, like Baudrillard who finds in the poetic anagram a proof for the destabilised centred world and Perec who discovers in mediaeval and Renaissance constraints and anagrams the generation of life. We have already witnessed in the introduction the palindrome as a case of the anagram's 'end condition', as structures traditionally related to death and re-birth, fire and water, cancellation and consumption of meaning.

Libeskind's opening to this space of 'difference', architect Aldo Rossi (1931–97) observed, 'ignored the *avant-garde* and the Modern Movement'.[349] He looks backwards to the achievements of medieval and Renaissance theory and architecture, drawing his main references from Vitruvius (first century BC), Thomas Aquinas (1225 or 1227–74), Giulio Camillo (around 1480–1544) and Bruno (1548–1600).

---

[347] Libeskind, *Countersign*, p. 38.
[348] Ibid.
[349] According to Aldo Rossi: 'If we look at Daniel Libeskind's work and read his writings, we realize (notwithstanding any cursory impressions) that he has ignored the *avant-garde* and the Modern Movement; indeed everything that is the outcome of positivism.' Taken from: Libeskind and Eisenman, *Chamber Works*, p. 13.

Reading Machine

The first machine is the *reading machine*, (fig. 106), or the machine for reading architecture. It is based on the drawing of Agostino Ramelli (1531– c.1600), (fig.107), from his book *Le diverse et artificiose machine* (1588) ('The various and ingenious machines').[350] Ramelli's design is a machine that consists of bookshelves on a wheel. The operator sits in front of the wheel, and as the wheel rotates can go from book to book, being able to read many books simultaneously or go forwards–backwards along them in a cross-referencing process. It could be seen as a very early example of a referencing machine or programme or a hypertext where circulation around the information is not linear.

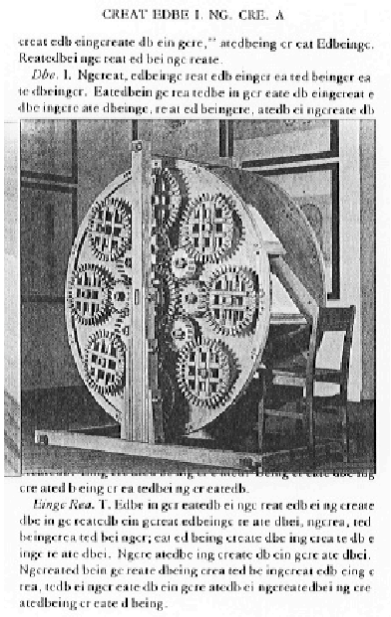


Figure 106 Daniel Libeskind, reading machine, 1985. In the background is the anagram of the words "Being Created". From *Countersign*, London, 1991.

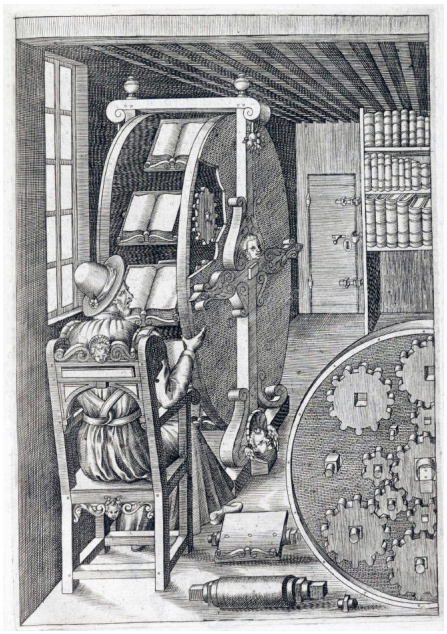


Figure 107 Agostino Ramelli, drawing, 1588. From Agostino Ramelli, Martha Teach Gnudi and Eugene S. Ferguson, *The Various and Ingenious Machines of Agostino Ramelli*, Baltimore, 1976.

[350] Agostino Ramelli, Martha Teach Gnudi and Eugene S. Ferguson, *The Various and Ingenious Machines of Agostino Ramelli* (Baltimore: Johns Hopkins University Press, 1976). Plate 188, pp. 508–9.

Libeskind, like a Renaissance scholar, not only imitates Ramelli's design but also builds his machine according to monastic craftsmanship, using sixteenth-century technology, without electricity or power tools and with glueless joints. By a craft that rejects 'all modern techniques and technology' he 'reject(s) modern thinking about architecture'.[351] His reference is Alberti and Vitruvius and is dedicated to the 'diagonally crucified humanist'[352] of Raphael and Leonardo.

There are eight shelves, and each of them carries a book made by Libeskind: 'The whole mechanism is intended to support eight words.' Each of those books/words contain anagrams, in particular charades, of the words Energia, Being Created, Power, Subject, Spirit, Will to Power, Being, Revolution. One of the eight books was stolen before his machine was exhibited and we are not sure of its contents; Libeskind mentions that it was the book of Ideas and we can assume that it was another anagram, of the word Revolution. The charades are arranged in the following way:

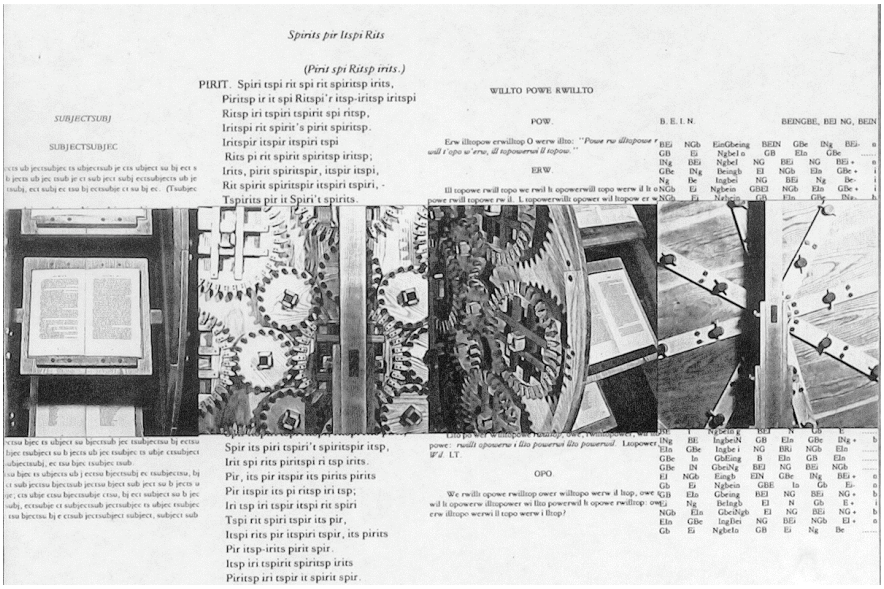


Figure 108 Daniel Libeskind, reading machine with the text of his books. From *Countersign*, London, 1991.

[351] Libeskind, *Countersign*, p. 39.
[352] Ibid.

The reader-operator sits in front of the machine and moves around eight books of anagrams. According to Libeskind he used anagrams as the contents of his books because 'the text of architecture is a tautological text, which means that it says the same thing at the end as it said at the beginning, because the beginning was its end already'.[353] The machine is tautological because both the book – by rotation – and the text – by anagrammatic rotation – fold into themselves. Like the machine's rotation from book to book, the contents of the book (the anagrams) repeat and rotate themselves around the space of the page and the pages by their turn around the space of the book: 'The word revolution is used here in its etymological sense: a revolutionary machine because it revolves, and with each revolution comes about the revolution of the text which is propelled by it.'[354]

Libeskind's Ramellian machine is a three-dimensional over-layering device and possibly a mnemonic tool, not only in the mind of the medieval user but also for Libeskind's contemporary one. It is possible that Ramelli was aware of the mnemonic techniques developed in the same period. Certainly, Libeskind is aware of Yates's work, which is one of his main references for these machines. The use of anagrams adds to the machine's mnemonic value as they are textual features in which are contained the mechanisms for remembering and forgetting. According to Carruthers:

> 'communal forgetting' was also mastered by the Christians – not through some variety of amnesia, but by applying carefully the mnemotechnical principles of blocking one pattern of memories by another, by 'crowding' or 'overlay', and by intentional mnemonic replacement … 'Crowding' was a well organized principle of 'forgetting'. Too many images overlapping one another in a given location, images that are too much alike, will confuse and even cancel one another out … Things that are completely different and separate do not block each other: they act instead as two distinct memory sites. Where two or more competing patterns exist in one site, however, only

[353] Ibid., p. 40. We have witnessed an example of tautological text in palindromes, as they have the ability to fold into themselves (introduction).
[354] Ibid.

> one will be seen: the others, though they may remain potentially visible, will be blocked or absorbed by the overlay.[355]

In this sense, it seems that this machine for reading architecture is mainly a machine for remembering and forgetting. We have already examined the same phenomenon in palindromes as they are structures with the ability to return to their origins as they fold back on themselves: that their ending is their beginning, and related to the value of the consumption of meaning. As mnemonic devices, they have the ability to facilitate memory but at the same time erase it by overlaying their distinct elements.

The machine's operation could be compared to the medieval and Renaissance *memory wheels* of Llull, Bruno, Camillo, Kircher or Leibniz (fig. 19, 49, 50, 51); in fact the machine could be seen as a three-dimensional translation of one of those wheels. But also the drawings of the town of Palmanova (fig. 104, 105), in the square of which the machine was going to be placed and operate, looks strikingly similar to these *memory wheels*. The wheels could rotate within memory to create undetermined in number and content combinations of meaning, and it seems that Ramelli's and Libeskind's machines have the ability to externalise such an internal process, in a mechanical way. As with Camillo's artificial wheel, we could claim that in both Ramelli's and Libeskind's wheel the experience of space occurs in the middle, within the 'whirlpool of artifice', expressed in Camillo's textual machine analysed before. Both Ramelli's and Libeskind's machines are parallel in function but operate within a different context: Ramelli's machine in a Renaissance one and Libeskind's in a post-modern one. And Libeskind's approach to language brings to mind Camillo's use of antithetical pairs in his wheel, as forces for the arrangement of memory's space,

[355] Carruthers, *The Craft of Thought*, p. 54.

disassociated from emotional or psychological content values, used as building blocks for the creation of a space of knowledge or rhetoric space, within someone's memory.

These machines have been in the literal sense lessons in architecture as each of them prepares the necessary conditions for the creation of the next one. The first one – reading machine – is a copy of a medieval design; the second one – memory machine – goes a bit further to investigate the procedures of memory, already introduced by the first machine. At the same time we see Libeskind's individual approach. What is really remarkable is that these lessons, based on the claim that architecture has reached an *end* and trying to teach a 'new' architecture, look back to the Middle Ages and the Renaissance, to the invention of perspective and to the first representations of architecture and the earliest attempts to write architectural history, as Mallarmé tried to renovate poetry by looking in *Un Coup de Dés* 'beyond the ancient calculus that maneuver with the age forgotten', ('hors d'ancient calculs où la manoeuvre avec l'âge oubliee'). It is like suggesting that the history machine has completed a circle, revolved, and it is time to reconsider or re-study everything that has been its origins.

Memory Machine

Libeskind introduces the *memory machine* (fig. 109) by using the following words:

> Let me move on to remembering architecture. I've been told that when people die (and I've also read a lot about it), when one remembers one's life before committing suicide or when dying in a hospital, life reels rapidly in front of one's brain. And at the end things become quickly apparent. They very quickly pile up into the soul. In an end condition, then, things pile up rapidly in the memory of what architecture may have been.[356]

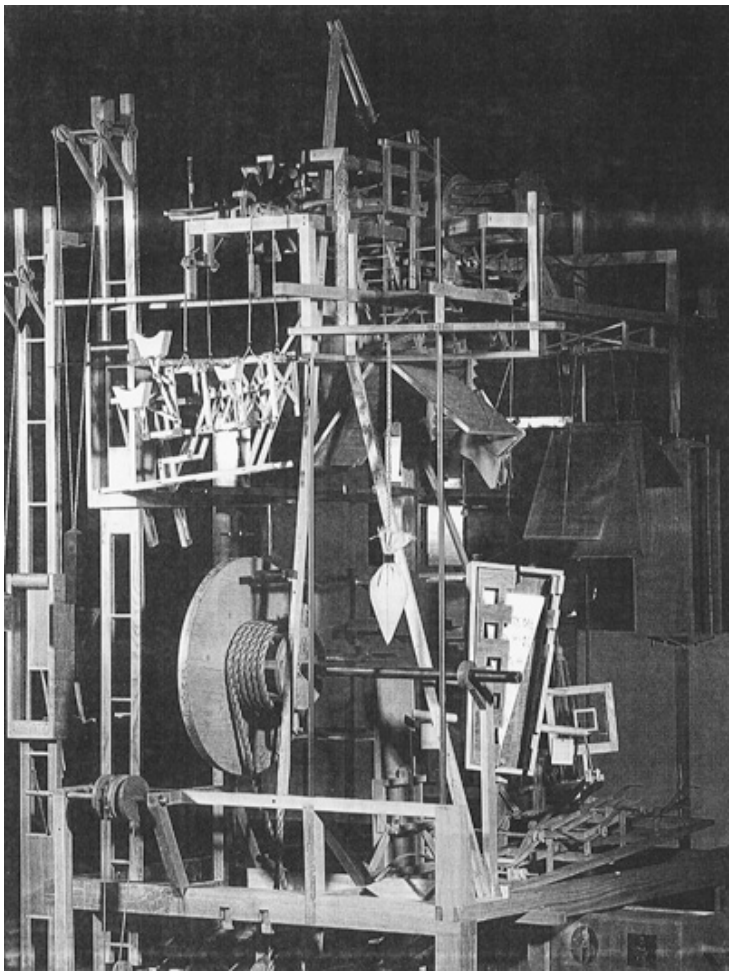


Figure 109 Daniel Libeskind, memory machine. From *Countersign*, London, 1991.

[356] Libeskind, *Countersign*, p. 40.

The pictorial function of memory has a very important role in how this machine functions; its purpose is to pile up the images of the 'end condition' of architecture. Libeskind does not describe the exact operation of the machine, but it consists of wood, paper, string, metal which was used 'for non-structural reasons', and is dedicated to Ideas. Generally there are things 'in this small memory machine to remember. There are little horses, little cloud machines, little wave machines, all sorts of instruments' as well as a 'schizophrenic forum'.

The memory machine is inspired and dedicated to Camillo. Libeskind's other main reference for the second machine is Bruno, another personality who is closely related to the tradition and development of memory techniques and whose poetical and textual structures have been analysed for their spatial qualities. A topic of interest is Bruno's use of palindromic symmetries in the production of 'spatial' poetry. Libeskind has examined closely descriptions of Camillo's memory theatre and he uses similar techniques for his machine. He uses text again but in a different way; instead of in books, it is over-layered or imprinted on parts of the machine.

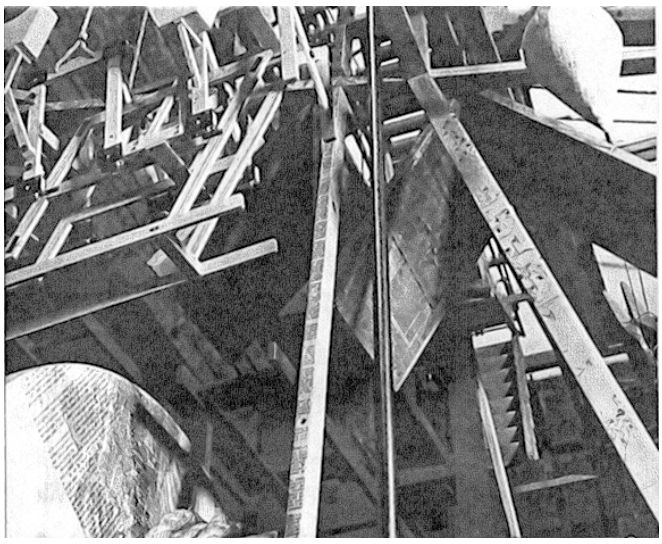


Figure 110 Daniel Libeskind, detail from memory machine. From *Countersign*, London, 1991.

Form and text are combined according to Libeskind in a 'different' more subjective way in order to create an 'intersubjective dialogue' between Ideas whose realm is that of 'political measurement'. The formation, evaluation or measure of Ideas is a political act, in the sense that it is a dialectic procedure between different persons/opinions/subjects. In this machine we can clearly observe Libeskind's previous research in design and representational methods. It is like a three-dimensional realisation of his particular and well-known drawings dedicated to Heraclitus.[357]

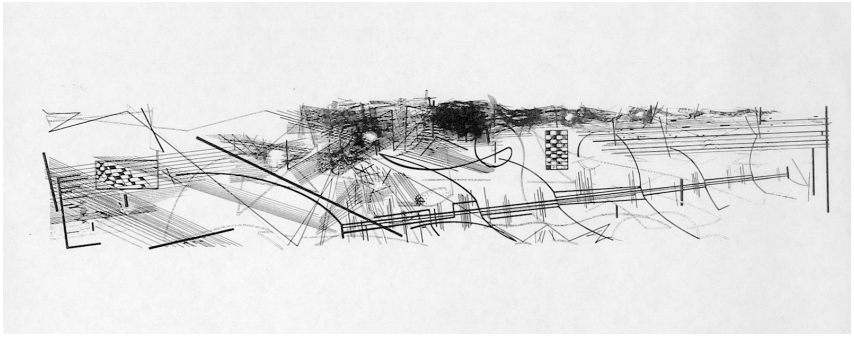


Figure 111 Daniel Libeskind, drawing dedicated to Heraclitus. From Daniel Libeskind and Peter Eisenman, *Chamber Works: Meditations on Themes from Heraclitus*, London, 1983.

The lines in these drawings could be compared to the *linee occùlte*, the invisible lines which guide the mind and someone's memory to their predetermined path.

The meditations on themes from Heraclitus question the representational value of the architectural drawing. The 'unhooking' of the signifier from the image of the architectural object is once more the procedure with which a new architectural space is created, the space of 'difference' or a different space of 'not-architecture'. The viewer/reader is called to encounter the drawing as a text using the representation of architecture in a similar way to how we use language.

> First, what is it to read a drawing? Traditionally, we read writing and we see drawing. But if we transgress that custom, then we accrue to drawing the

[357] Libeskind and Eisenman, *Chamber Works*.

> privilege of the autonomy of the reader. If we limited ourselves to seeing drawings as drawings then there would be no possibility of unhooking signs from objects (and thus 'not-architecture' from architecture), a privilege of reading. In architectural drawing, there is no metaphysics of 'hooking' – the image is not conceived as 'hooked' to the object in the way that the sign is to a signified in writing. Traditionally, in the text, there is no necessary image relationship between the sign and its object or meaning; this is not the case in drawing since the image is a replication, representation or abstraction of an object – but is not significant of it. The notion of 'unhooking' is crucial to discovering the 'not-architecture in Libeskind's work, for it is in its free play of signing, its signing of signing, that we read these drawings as drawings, and thus as 'not-architecture'.[358]

In both the Renaissance and the post-modern, attempts were made to relate language and architecture with the aid of the anagram. In the Renaissance the anagram was used to create a language, text, poem and mnemonic device as solid as an edifice. Palindromic symmetries in poetry were compared by contemporary critics like Eriksen to triangular or vaulted architectural features, like Brunelleschi's dome of Santa Maria Dei Fiori, Florence. In Libeskind's projects (the *Lessons about Architecture* and the *Meditations on Themes from Heraclitus*) we witness the related procedure: drawing and architecture are encountered as language, text and memory machine in order for their solid nature to be destabilised. The anagram comes to break the linearity between architectural object and its signifier, making an opening to a new space of 'not-architecture' not experienced before. In both cases the anagram has an important role because of its density and tautological nature: as an extremely dense and difficult-to-construct linguistic structure that contains inside it dispersed multiple signifiers in which is hidden or 'exterminated' either the name of God in the anagram, or the signifier's own nature in the palindrome.

According to what has been mentioned above, the memory machine gives the impression of a machine destined to remember or forget. Libeskind deliberately uses

[358] Peter Eisenman commenting Libeskind's project in the introduction from *Daniel Libeskind*. Ibid., p. 7.

the techniques of crowding and overlaying, as well as the invisible mental *linee occùlte*, introducing a machine that brings memory to a stage of erasure, that creates mental sites which are then cancelled. Introducing the Renaissance techniques of crowding and over-layering to the contemporary relations of text and architecture, he suggests that the 'end' is looking forward to the beginning and the text is erased or cancelled not by forgetting but by folding over itself, because of its tautological nature, exactly like the palindromic text. In mnemonics, crowding and over-layering were used to erase memory and create a new topological space based on the distribution of images. In Libeskind the destabilisation of the equilibrium, by breaking up the linearity of the architectural object, is what carries space close to its 'end condition', thus to its self-production or 'immortality'.[359] Memory, text and image of architecture are self-referential; their cancellation is their re-generation.

[359] 'Immortality' as a condition of 'recession of outcomes', according to Baudrillard: Baudrillard, *Hystericizing the Millennium*.

Writing Architecture Machine

The third machine is the *writing architecture machine* and contains in a sense the two previous ones since it 'processes both memory and reading material'.

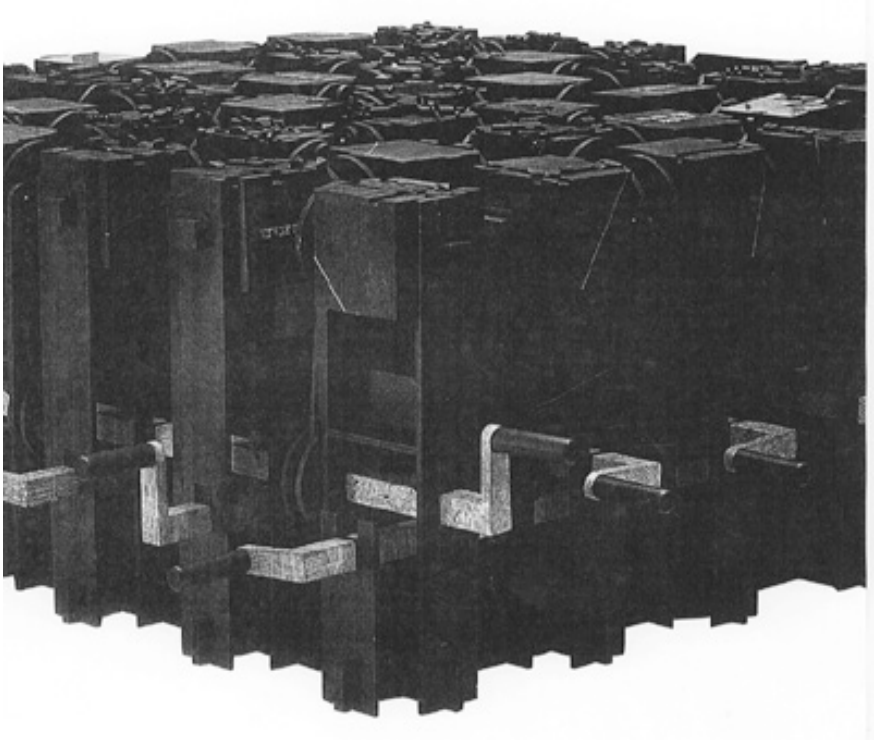


Figure 112 Daniel Libeskind, writing architecture machine. From *Countersign*, London, 1991.

This machine has the shape of a three-dimensional 7 × 7 grid of cubes, where Libeskind distributes his elements. The books he used for his first machine – translated into four languages – become the 'lubricant' for this machine; in other words, the 'gear' from which movement transfers to the cubes. These gears are the cubical bars that can be rotated by the user, suggesting that the procedure of reading is facilitated by language but dependent on the user's or reader's subjective interpretation. Text is what brings movement and motion to the machine but it

depends on the action of the individual who operates the machine, or who is asking the question and waiting for an answer from the machine. Every rotation-operation of the machine, as well as its form made of a number of cubes, recalls of *Un Coup de Dés*. By this gesture Libeskind introduces an aspect of randomness of the machine's 'recession of outcomes', a certain conception about time related to Heraclitus, as well as a reference to his previous project, *meditations on themes from Heraclitus*.

On this 7 × 7 three-dimensional grid Libeskind distributes his elements. On each side of the cube he places:

> The dwelling unit
> A piece of metal which is a reflection of what shatters the mathematics of it [meaning the mathematics of the dwelling unit].
> Side three consists of a geometric sign which is actually an architectural horoscope [possible relations to Vitruvius].
> The enumeration of the forty-nine saints, the saints who are needed for the completion of the pilgrimage: the pilgrimage of Absolute Architecture.[360]

Figure 113 Daniel Libeskid, detail of writing architecture machine. *Countersign*, London, 1991.

[360] Libeskind, *Countersign*, p. 40.

There is a striking similarity between Libeskind's *writing architecture machine* and Jonathan Swift's (1667–1745) *word machine* described in the book *Gulliver's Travels* (1726) and illustrated by J.J. Grandville (1840) (fig.114), for the 1840 edition. When Gulliver visits the Grand Academy of Legado he is presented by the professor with a permutational machine 'for improving speculative knowledge by practical and mechanical operations'.[361] The description of Swift's recalls Mallarmé's *Un Coup de Dés* and the way that the poem creates meaning by a throw of the dice. Here is the description of Swift's device:

> The superficies was composed of several bits of wood, about the bigness of a die, but some larger than others. They were all linked together by slender wires. These bits of wood were covered on every square with papers pasted on them, and on these papers were written all the words in their language … but without any order … The pupils … took each of them hold of an iron handle, whereof there were forty fixed round the edge of the frame, and giving them a sudden turn, the whole disposition of the words was entirely changed. [The professor] then commanded six-and-thirty of the lads to read the several lines softly as they appeared on the frame; and where they found three or four words together that might take part of a sentence, they dictated to the four remaining boys who were scribes … the professor showed me [Gulliver] several volumes in large folio already collected, of broken sentences, which he intended to piece together, and out of those rich materials to give the world a complete body of all arts and sciences.[362]

It is unknown if Libeskind was familiar with this example, but the pupils of the above description recall the citizens of Palmanova and the architectural answers they are seeking, the *broken sentences*, pieces, able to provide the *complete body of all arts and sciences*. By means of a *complete body* produced by infinite permutations of finite objects Libeskind, like the 'professor' of the Grand Academy of Legado, is seeking to provide, with the broken sentences, an architectural language – like Vitruvius, who tried to bring together with his *Ten Books of Architecture* the scattered

[361] According to Janet Zweig, 'the "professor" in the story has been described variously as a caricature of either Leibniz or Llull'. Janet Zweig, 'Ars Combinatoria: Mystical Systems, Procedural Art, and the Computer', *Art Journal* 56, no. 3 (1997): 23.
[362] Jonathan Swift, *Travels into Several Remote Nations of the World ... By Lemuel Gulliver ... Illustrated by Grandville ... With Copious Notes, a Life of the Author, and an Essay on Satiricial Fiction, by W. C. Taylor* (Hayward & Moore: London, 1840), pp. 302–3.

pieces of the dismembered body of architecture and at the same time of the Roman Empire.

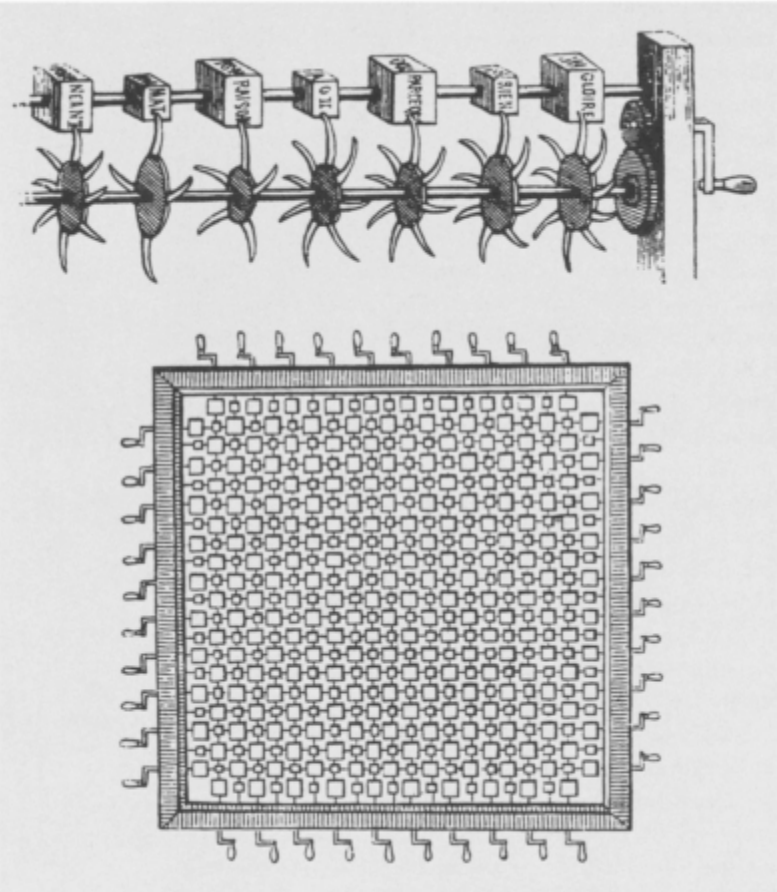


Figure 114 J.J. Grandville, word machine, illustration from *Gulliver's Travels*. From Jonathan Swift, *Travels into Several Remote Nations of the World ... By Lemuel Gulliver ...*, London, 1840.

Libeskind's *writing architecture machine* – as well as Swift's machine[363] – refers back to the processes of the *art of memory*, according to which the orator had to distribute on each 'topos' a 'topic' for memory and recollection. Those topics were often illustrated in someone's imagination by 'topoi' (locations) or building blocks of imaginary buildings.[364]

[363] In the edition of Swift's book used, Lull is referenced as the inspiration of the University of Legado's writing machine. Ibid., p. 303.
[364] Frances Amelia Yates, *The Art of Memory* (London: Pimlico, 2003).

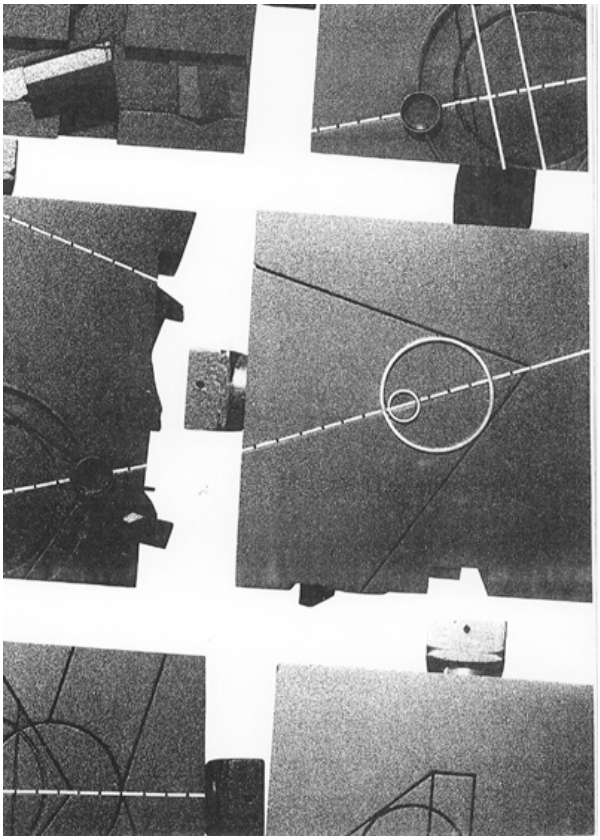


Figure 115 Daniel Libeskind, grid of the writing architecture machine. From *Countersign*, London, 1991.

In this machine we see Libeskind working in a similar way to Perec, in *Life A User's Manual.* In his book Perec overlaid a grid on the façade of an imaginary building, which was responsible for the distribution of the characters and their stories in the space of the book, determining also its structure. In a similar way, Libeskind here creates a spatial – instead of a two-dimensional – grid, where he distributes his elements using the text as the generator of his machine. Perec's literal machine is generated by the constraints themselves, and the book in a sense writes itself. In both cases the creator of the machine becomes a spectator of its operation, and we have the multiple interpretations and readings of the individual reader or operator of the book-machine. Both of them are interested in investigating the subject of memory and time in the creation of space, literary or architectural, and draw from the same techniques and practices like mnemonics, letter permutations, the issue of time, experiments with

non-linear narratives and other disciplines. In both of these projects, we see the effect of over-layering as both Perec and Libeskind superimpose grids of elements to shape their structures and use machines for the self-generation of space. Perec's work is based on the grid, in order to create a mental topography and a density of networks where the reader is challenged to find the way through the book. He attempts to create strong connections between seemingly diverse elements and to facilitate memory. In Libeskind the same techniques are self-referential; it is a tautological procedure of the end and beginning, of creation and death, of the meaning and its cancellation. It consists mostly of a game of opposite forces. In his case memory is facilitated as a procedure of forgetting similar to Bruno's emblem or the oppositional pairs of Camillo's *artificial wheel*.

Perec (in *Life A User's Manual*, *Le Grande Palindrome*, *Lieux*) and Libeskind (in *Three Lessons in Architecture*) are experimenting with the creation of form by using similar structural elements, constraints and the anagram, but each of them for different reasons. Both try to renovate literature or architecture or to create difference, but Perec seems to be looking for a dense form in literature by using architecture, and Libeskind to loosen the rigid forms of existing architecture through text. For Perec various constraints are combined and then are absorbed by the book; at the end he hides the mechanism, and the readers'/operators' awareness of it becomes less important. For Libeskind the machine itself is the most important element and its mechanism is exposed; the machine itself is its operation. The operator-reader has to 'read' space like a text, consider how it functions and translate the outcomes based on subjective 'political measurement'; what creates space is the exact procedure of interpretation. Perec creates an enclosed system-space, the book, which belongs to the space of literature, and architecture is used as a metaphor; the space he creates is

mnemonic and self-referential, depending on the reader's action, and starts from and returns to the reader. Libeskind places his system into a variety of different systems – the main square of Palmanova, the Biennale, the space of architecture, the space of the text, the space of memory, the space of history, the 'space of difference' – examining its operation; the machine's operation is self-referential (or tautological) but not of the system itself, as it refers to the space where it is placed every time (in Palmanova, in the Biennale, in the Renaissance of Guglio Camillo, Giordano Bruno, Vitruvius, Alberti, Michelangelo, da Vinci). The reader/viewer is the observer of the machine's operation and individual action is that of interpretation. The space Perec creates is experiential through memory, and Libeskind's is remembered through experience.

Conclusion

The wider subject of this research is the relationship between text and space in literature and architecture, and all the examples analysed thus far examine similar methodologies for organising space through writing and writing through space. To define the subject even further: it is not simply that all text has spatial qualities and that all space has textual ones. In particular, in architecture, writing has typically been associated as part of the design process either in the form of a construction-brief or architectural criticism but this dissertation focuses on writing as an active constituent of certain kinds of design and space.

It is noteworthy that the word 'draft' in English is used to denote an expression of an idea on paper both by writing and by drawing. The anagrams which are commonly used as architectural inscriptions very clearly address the possible relations between text and space. Anagrams' literary structure shares geometric similarities – such as symmetry – to drawings and buildings, thus making it easier for us to recognise similar structural and spatial qualities between drafts, written or drawn. The kind of anagram I am using to explore this relation between text and space is the palindrome. This makes the palindrome a reference point, a point of departure and a place of return from which to draw conclusions.

The reason I view the palindrome as spatial is because of its qualities, values and characteristics analysed mainly in the introduction and in 'A Definition of the Palindrome'. These qualities open to a discussion of the actual space of the palindrome (Palindromic Spaces), which is more related to how this space is experienced. All the examples from the works of Perec, Mallarmé, Polieri and

Libeskind aim to examine exactly the experience of palindromes and similar structures in either literature or architecture.

The palindrome is a very specific hierarchical sequence of elements arranged under a law of constraint. It is a process both to write and to read, a process austere in form – because it follows a constraint – but with particular symmetrical characteristics which, apart from its distinctive visual character, generate motional and temporal reversibility. This motional (in)dependence[365] reveals more possibilities of meaning depending on the path followed within this structure. For example the word 'evil' means malevolence or sin, but reading the word as a palindrome, 'evil' is a process which reveals, in a backward movement, another meaning, 'live', to exist, survive or dwell. At other times, of course, the meaning remains the same, no matter which way we decide to move, which questions even the very notion of movement itself. More than anything, the palindrome is a way of reading, a way of seeing and perceiving things: a way characterised by a highly defined geometrical process.

The palindrome is a fixed argument, as the letters that compose the words are fixed, but it has changing values depending on the way it is read. Some paths or movements are more possible than others, depending on the reader's intuition, knowledge, imagination or simply desire. Consequently the palindrome demonstrates that meaning depends on movement and direction, like the throw of the dice. More possibilities of movement appear as the palindrome's form extends from the line into two or three dimensions. In palindromic webs written on paper, this gesture takes various forms such as squares, circles or triangles or is written in the body of animals and in the streams of water. In palindromes hidden in the book's three-dimensional

[365] I write (in)dependence to denote both the words 'dependence' and 'independence' because the palindrome demonstrates independence of movement in the creation of meaning but also is dependent on movement to operate.

space, their form is less apparent but can still structure our experience as readers, as in Mallarmé's *Un Coup de Dés*.

To unfold the concluding discussion, I am going to use two examples one of a Spatial Palindrome and the other a Palindromic Space. Their study aims to wrap up the main theoretical points and to look back to the case studies analysed before. The first example comes from the tradition of spatial writing (Spatial Palindrome) and will demonstrate how movement, distance, direction and geometry operate in text and participate in the process of creation of meaning. The second example will investigate how meaning generated by palindromic movement has the ability to open up to the poetic space of experience (Palindromic Space). At the end I will try to cross through the spatial experience facilitated by these examples to explain how the palindromic spaces have been expressed in architecture as domes, arches, fountains thresholds, corridors, stairs, passages and entrances.

The first example comes from poet Publilius Optatianus Porfirius (fourth century AD) and his verses composed as panegyrics and praises for Constantine the Great, Roman emperor (272–337).[366] Optatianus' poems are called *Carmina Quadrata* because they are written in rectangular grids or *Carmina Cancellata*; meaning – which operates at multiple layers – is cancelled, or merged in the background. Optatianus' poems are some of the earliest existing examples of their type and a point of reference for most later cases of formal writing. At a first glance Optatianus' poems are written on a rectangular grid: letters have exactly the same distance between them and there is no space between the words – something very common in ancient writing and inscriptions. But their structure is very accurately calculated and measured, so when you start moving in various directions within the

[366] Publilius Optatianus Porphyrius and Giovanni Polara, *Publilii Optatiani Porfyrii Carmina* (Torino: In aedibus Paraviae, 1973).

text other poems slowly start to emerge from the background. These are named intexts. The intexts create formations and web-like structures that recall textiles, an altar, a palm tree or jewels. Optatianus often used acrostics and anagrams, and also wrote palindromes, such as poem No. VIII, *versus anacyclici*, which can be read backwards, or has incorporated palindromic lines into his poems (such as line 9 in poem No. XV). In most editions of Optanianus' poems, the possibilities of movement and intexts are marked with different font sizes, but there are also examples such as an edition of 1595 where intexts are marked in red ink, producing a completely different visual effect.[367]

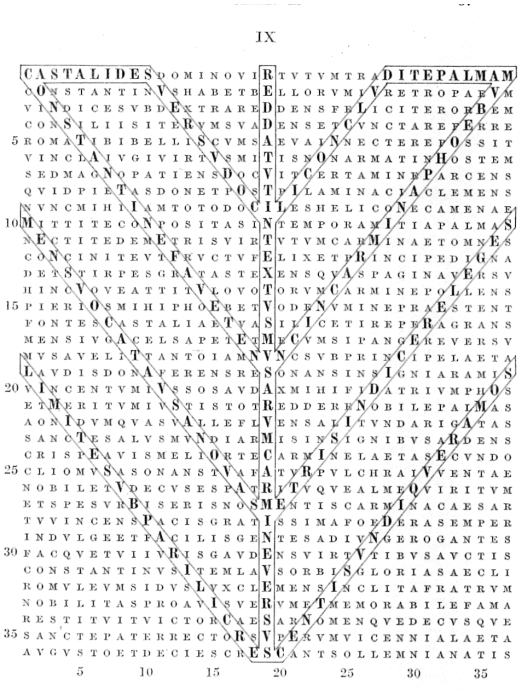


Figure 116 Optatianus, poem IX in the shape of a palm tree. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina*, Torino, 1973.

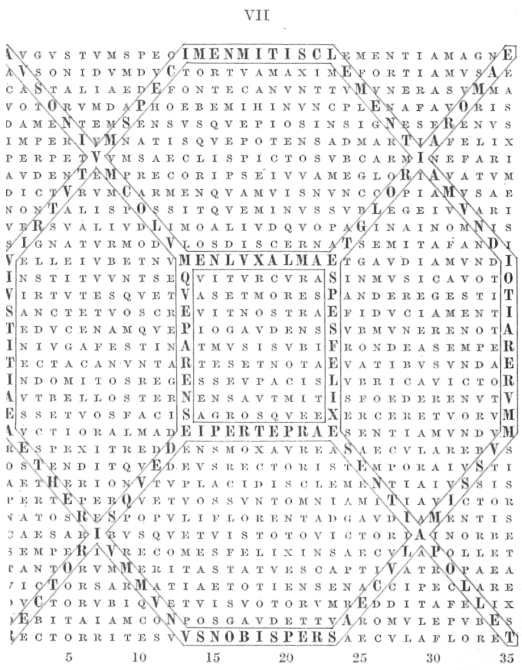


Figure 117 Optatianus, poem VII in the shape of a jewel. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina*, Torino, 1973.

[367] Publilius Optatianus Porphyrius, *[Panegiricus ... Dictus Constantino Augusto, Etc.]*, [Another edition.] ed. (Augustæ Videlicorum, 1595).

For example, in poem No. XXII, (fig. 118) to read the intexts you have to follow open and closed forms within this textual space. These forms, depending on how many letters compose each intext, create the images of a cross, of parallel and antithetical lines, as well as a diamond-shaped rhombus (fig. 120, 121, 122, 123). To read this poem or the poems within the poem, you have to move in multiple layers and open up your imagination to a space of reading based on the geometric values inherent in the text or otherwise within the links between the letters that compose the text. Meaning is not created only by reading the background poem or each intext, but is a process of moving in various directions between poems, shapes and forms: between background and intext, and between the intexts. At the end, all poems, forms, movements and their various combinations create the space of the poem, which recalls a textile woven with words, a fence or a window.

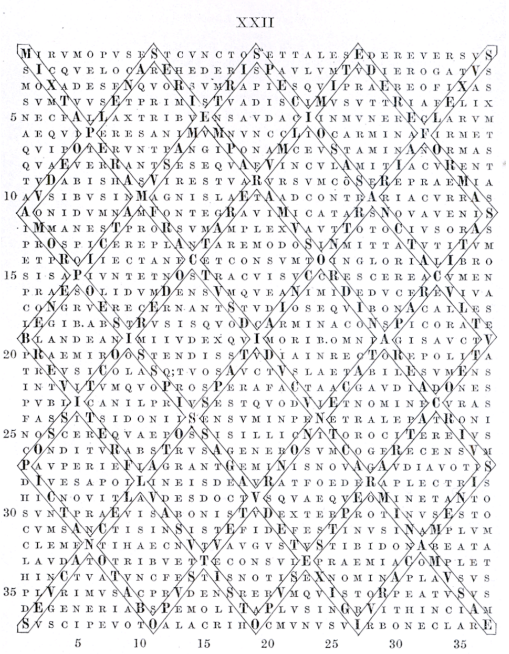


Figure 118 Optatianus, poem XXII in the shape of a textile or a fence. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina*, Torino, 1973.

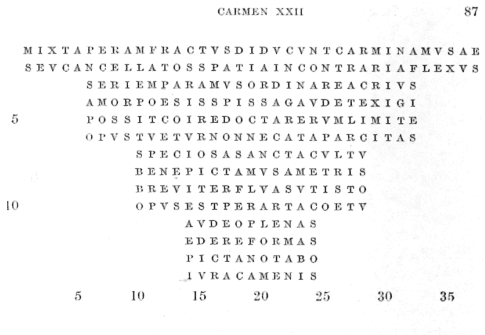


Figure 119 Optatianus, poems within the poem. Intexts of poem XXII. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina*, Torino, 1973.

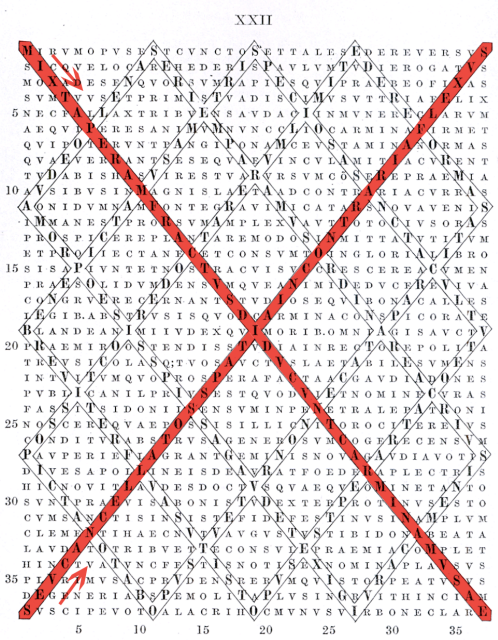


Figure 120 Intexts 37 letters. Produced by author.

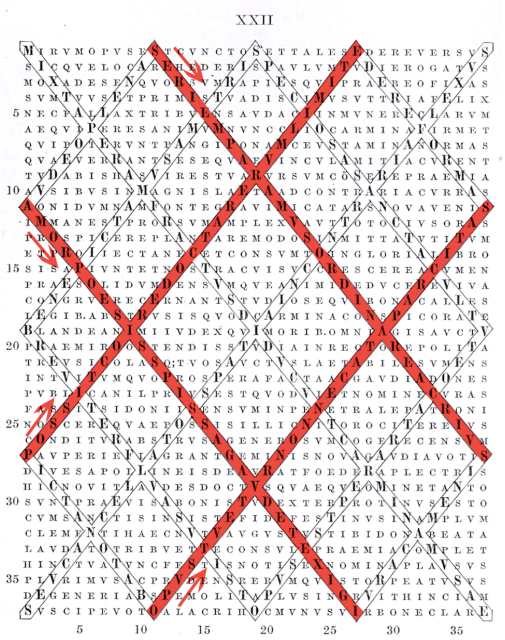


Figure 121 Intexts 27 letters. Produced by author.

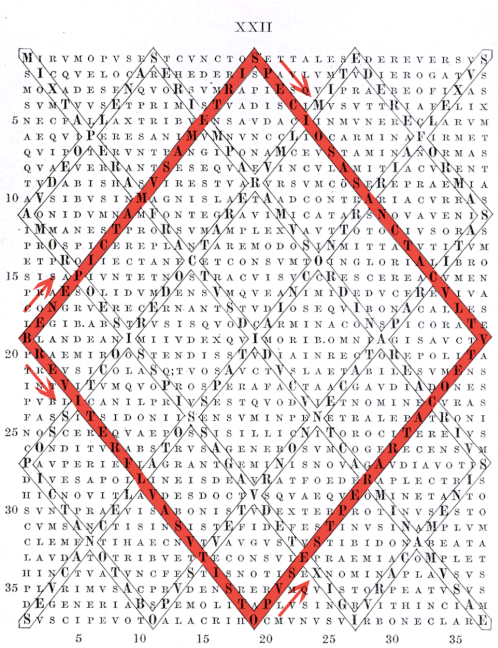


Figure 122 Intexts 19 letters. Produced by author.

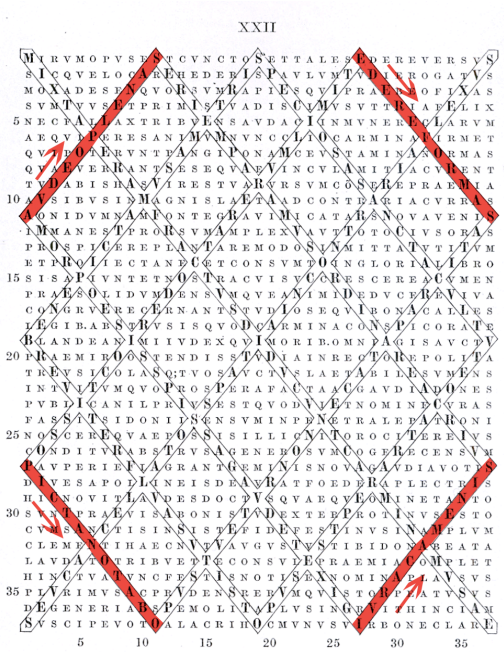


Figure 123 Intexts 11 letters. Produced by author.

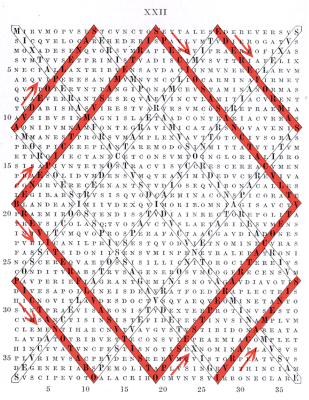


Figure 124 Intexts 19,11 letters. Produced by author.

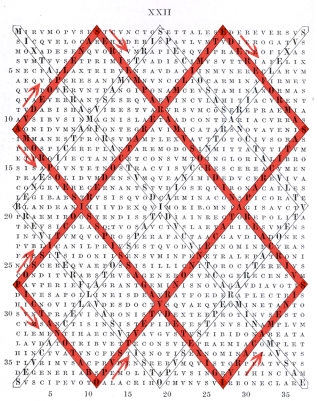


Figure 125 Intexts 27,11 letters. Produced by author.

Figure 126 Intexts 27,19 letters. Produced by author.

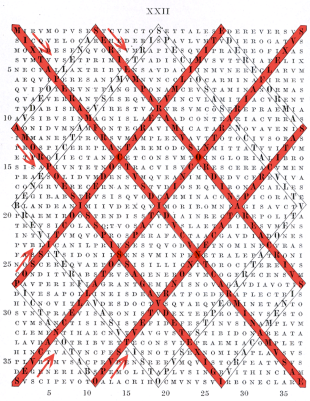


Figure 127 Intexts 37,27 letters. Produced by author.

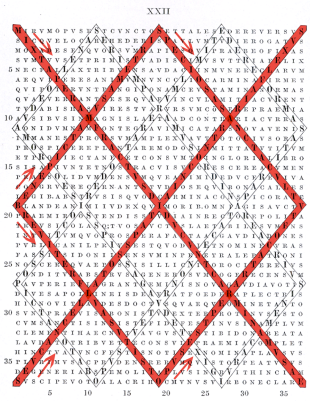


Figure 128 Intexts 37,19 letters. Produced by author.

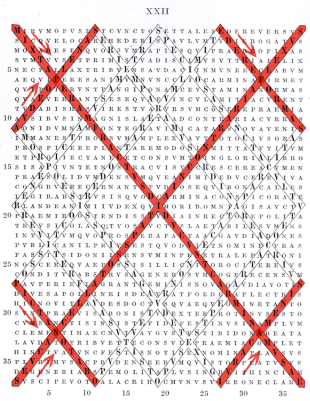


Figure 129 Intexts 37,11 letters. Produced by author.

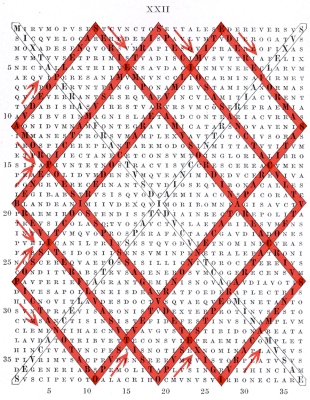


Figure 130 Intexts 27,19,11 letters. Produced by author.

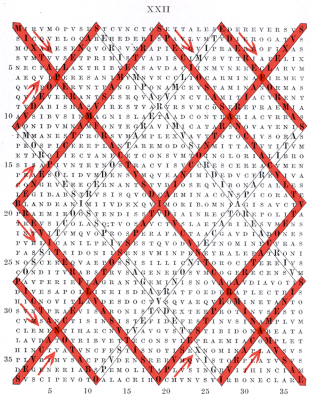


Figure 131 Intexts 37,19,11 letters. Produced by author.

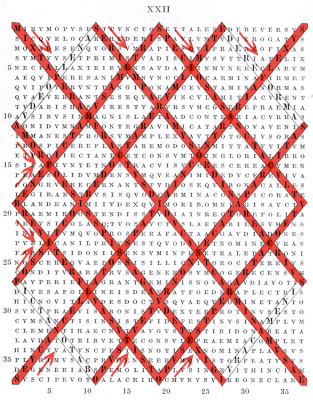


Figure 132 Intexts 37,27,19 letters. Produced by author.

It is very likely that these poems were written with letters made of precious metal against a dark blue or purple background.[368] This would contribute to the visually striking character of the poems but also would make this text look more like a precious object, a jewel. Unfortunately this effect is lost in the printed editions available now. Colours and textures, like velvet and metal, would also add to the contemplative or meditative character of such a text-object, helping imagination to travel within the poem's space.

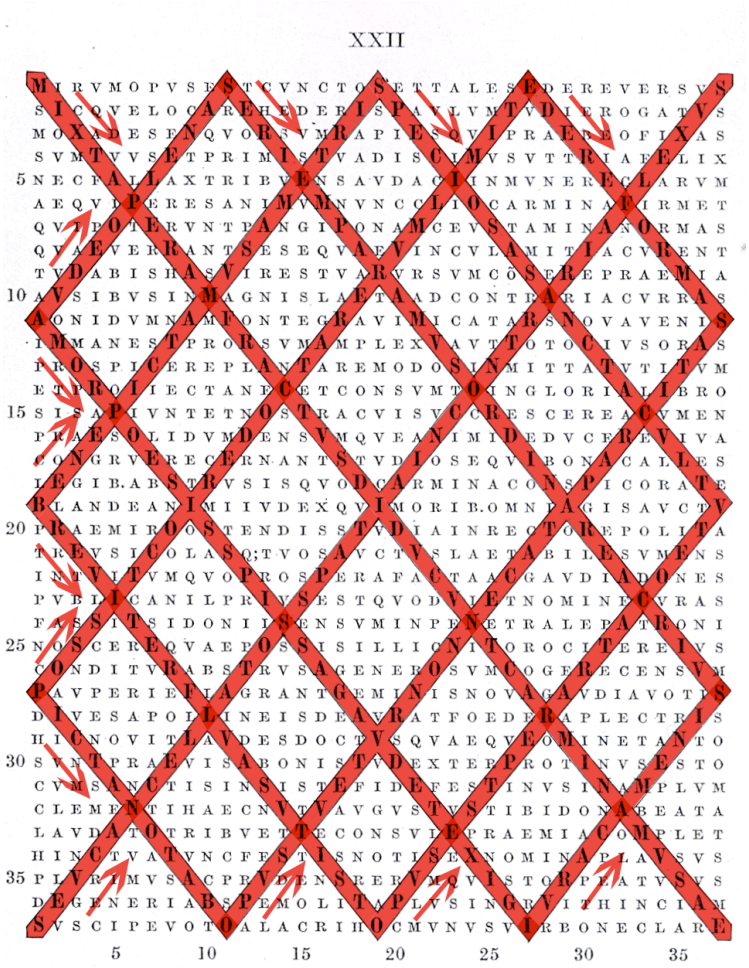


Figure 133 Main text, intexts, background and combinations of movement within the poem create the form of the fence, window or textile. Produced by author.

[368] According to Dick Higgins in his book: Dick Higgins, *Pattern Poetry: Guide to Unknown Literature* (Albany: State University of New York Press, 1987).

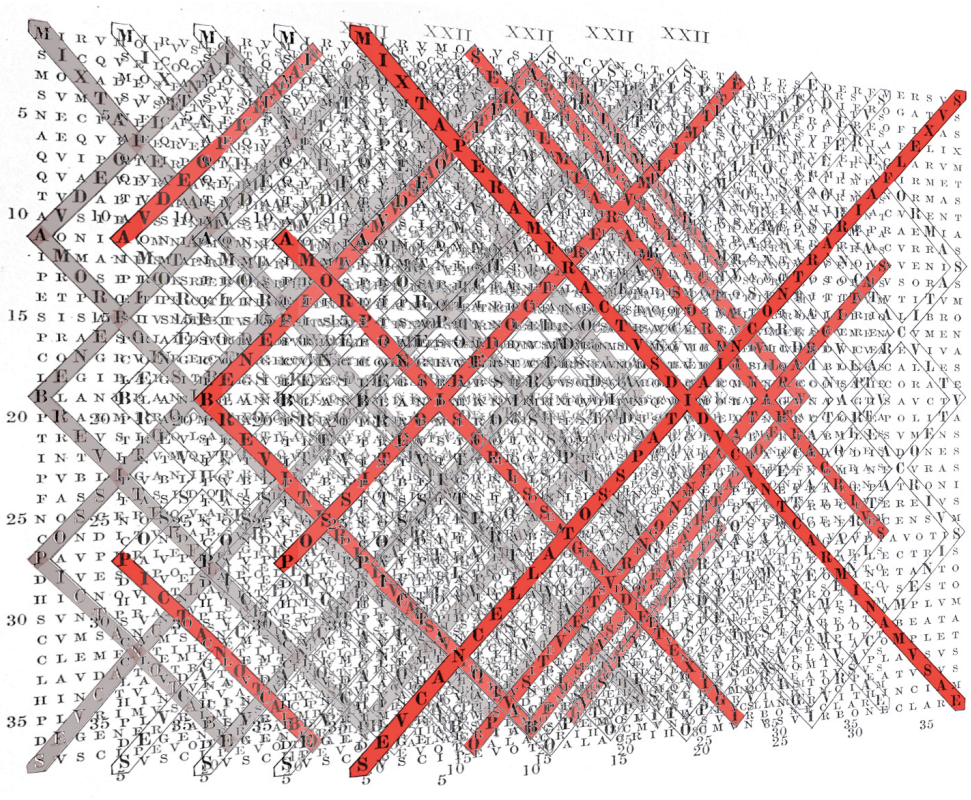


Figure 134 Drawing illustrating all the different layers of intexts and movements of reading of the poem. Produced by author.

The drawing (fig. 134) illustrates how the different layers of intexts when superimposed create the dense, almost solid structure of the poem, like a woven textile or a fence. The reading of the poem is a process that requires depth through various layers of words and concepts, similar to *Un Coup de Dés'* 'transparent reading'. As words and concepts layer up constantly, moving in various directions, careful geometric calculations by the poet help to construct the poem's space and hold it together from getting dispersed and lost in the void between them.

In another poem, No. XIX, Optatianus used the same technique to design, write and create the space, a sea, where an ancient Greek trireme is travelling carrying the symbols of Jesus Christ (fig. 135). This trireme is likely to represent the state of Rome, especially at the period of Constantine's transformation, when the capitol

moved from Rome to Constantinople and established Christianity's official status.[369] With careful textual calculations, the Roman Empire becomes a poem-ship travelling from West to East, and with God as a captain, or Christ as the wind or the sails of the ship. Such an idea is reinforced by the fact that Optatianus used two different languages for the poem, Latin and Greek. Although the content of the poem is highly moral, it is a very beautiful example of the visual manipulation of poetry to create meaning.

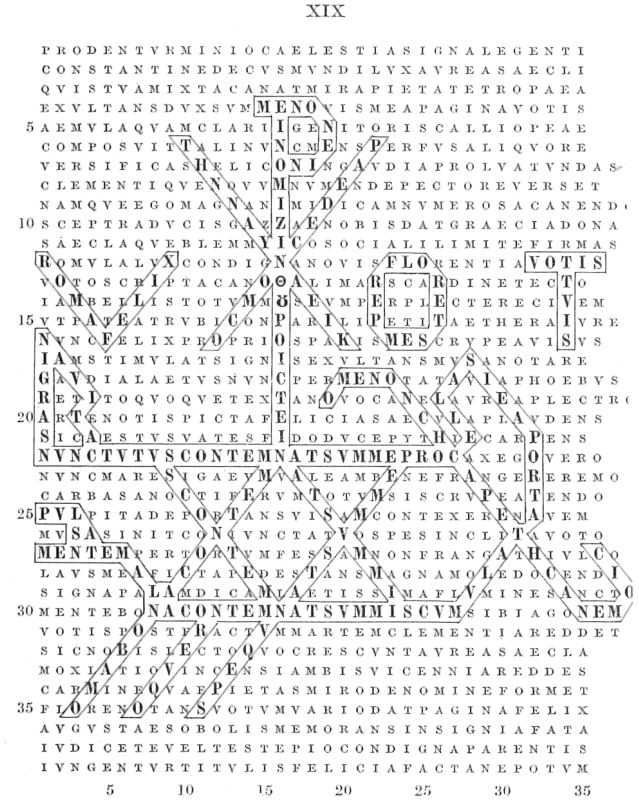


Figure 135 Optatianus, poem XIX where movements of reading take the form of a trireme. From Giovanni Polara, *Publilii Optatiani Porfyrii Carmina*, Torino, 1973.

[369] This image of the ship as the 'ship of state' refers to Linda Jones Hall's paper 'Constantine and the Designs of Publilius Optatianus Porfyrius; Picture Poems as Historical Evidence', presented at the twenty-ninth annual Byzantine Studies Conference, 16–19 October 2003, Bates College, Lewiston, ME. According to Hall: 'One poem, number 19, is an amazing pictograph which incorporates a ship decorated with these other motifs, and it appears to be a reference to Crispus' naval successes won for Constantine. However, it may also allude to the "ship of state" metaphor familiar to readers of Horace's poems dedicated to Augustus.' http://www.bsana.net/conference/archives/2003/abstracts_2003.html (accessed 5 November 2008).

Optatianus' poem, as a representation of the Roman Empire, brings to mind Vitruvius who, in his turn, attempted to re-create within the body of his book(s) the body of the Roman Empire. It is very likely that a similar theoretical approach to poetry, based in Pythagorean techniques, Platonic cosmology and Cicero's rhetoric, directed Optatianus to use complicated mathematical calculations to re-create the body of the new Roman Empire within the space of his poem.

But Optatianus' imagery and poetic space has also a strong similarity to Mallarmé's imagery of *Un Coup de Dés*, where the main image of the poem is also of a ship guided by its captain through a dangerous hurricane. Mallarmé in *Un Coup de Dés* uses a similar multi-layered technique and different fonts, font sizes and complicated calculations to create a dense web of multiple poems, which all together create a main poem, an object, the dice itself. Moreover, Mallarmé viewed his poetry as an object, arabesque or jewels, which is very similar to Optatianus' treatment of his precious poems as objects, textiles or jewels. Both poets create space by a movement of imagination; or otherwise a process based on our exchange of meaning and the links and distance between letters, words or concepts. A main difference is that Optatianus used the links between letters and words to generate literally the image of a ship which emerges visually from a sea of letters, the background. The reader has to remove the void between elements and movements to see the image, which is a solid one. For Mallarmé the image of the ship is not literally structured on the body of the poem but resides within the void between the links of its structure. There is no background, neither velvet nor paper, in *Un Coup de Dés*, but the void. All images of *Un Coup de Dés* emerge from the void – what links elements – and get dispersed together with all other words within the void, transforming the whole poem to an abstract image.

I do not intend to examine here the possible relations between Optatianus and Mallarmé. What is very interesting for this research is first, that examples like the above reassert that there is a very long tradition of spatial writing, and second, that this tradition is not related only to literary theory but also to design, something that Perec has demonstrated very vividly in his own example. Perec, in his web-structure book *Life A User's Manual*, in a similar way to Optatianus' trireme-state, created with very careful calculations the space of a building, its occupants and its life. All these examples, though they have literature or poetry as starting point, operate as objects where the text's geometry, materials and links between elements function together and can be experienced both by senses and by imagination.

It is very significant that all examples and all theories mentioned so far look backwards to the past in order to go forwards, to renovate: Pythagoras looked to Orpheus' poetic images of creation; Vitruvius looked back to Pythagorean techniques (together with history's techniques); Camillo to Vitruvius and Bruno to design his *Memory Theatre*; Bruno himself to Llull; Mallarmé, as a Parnassian at the verge of modernity beyond 'ancient calculus that maneuver with the age forgotten' ('hors d'anciens calculs où la manoeuvre avec l'âge oubliée') as himself states in *Un Coup de Dés*; Libeskind to Bruno and other medieval scholars.

A main point of reference throughout all these theories and eras is the role of the mind and imagination, which, when set in motion under the guidance and calculations of the poet or writer, creates meaning and spatial experience. Imagination in mnemonics is called inner vision or inner eye, in contrast to external vision and the function of the eye as an organ; by moving within this landscape you could recollect the book the way you do a city or a building. Mallarmé talks about 'transparent reading', or a 'fly of imagination'. Perec designs an 'imaginary building', *Life A*

User's Manual. Libeskind's machines, in order to generate 'architectural questions' and possible 'architectural solutions', have to be set in motion by the reader's imagination. Camillo creates a mnemonic building where imagination's motion within different levels can generate the whole world; Polieri talks about a 'theatre of total movement' of imagination. In all these examples, web-like text structures in one, two or three dimensions are used to demonstrate that imagination and memory has a spatial structure and the possible ways and paths for someone to move within; and in all these examples space is not clearly defined as textual or architectural but instead belongs somewhere between the two.

Between architecture and literature, a palindromic sequence could very easily mark both the position of the stones of a dome and the letters or words of a poem, meaning that architectural structure could easily develop to a poetic one, or the other way round, and that both could work together to create the final object, either a building or text. Both for the poet or architect, such an ordered sequence could have been a very useful compositional or design tool – something similar to Vitruvius' attempt to use and manipulate what he saw as all qualities of language, historic and poetic or formal ones, to create a writing on architecture, the *Ten Books on Architecture*, as a design tool and a useful architectural manual.

The second example, a Palindromic Space, focuses directly on the palindrome and the way it is experienced. This example will help us look at where the palindrome belongs within a tradition of spatial writing and how it relates to architecture and more specifically, why it has been used in arches, domes and fountains and was written circularly or in grids. This example comes from Giordano Bruno's book *On the Composition of Images, Signs & Ideas,* printed in 1591, just before his prosecution and conviction by the Inquisition. In the foreword and introduction of the English

translation[370] in 1991, literary critic Manfredi Piccolomini (b. 1949) and composer, poet, printer and artist Dick Higgins (1938–98) state some important facts which help contextualise the book and Bruno's theory. First is Bruno's belief in analogy: he 'did not believe that the meanings of words, images, sounds and symbols could be defined semantically but could be understood intuitively and analogically through other words, images, sounds and symbols'.[371] This claim is very reminiscent of the Vitruvian belief in analogy in architecture or Cicero's idea of analogy in rhetoric, as analysed before. According to Bruno:

> Images do not receive their names from the explanations of the things they signify, but rather from the condition of those things that do the signifying. For in a text we are not able to explicate passages and words adequately by signs like those we trace out on paper, unless we think of the forms of sensible things, since they are images of things which exist either in nature or by art and present themselves to the eyes. Therefore images are named not for those things they signify in intention, but for those things from which they have been gathered.[372]

For Bruno meaning derives from the contemplation of images and the irrationality or arbitrariness of combinations in the process of understanding. Bruno believed that under this concept all arts merge together,[373] with poetry having a significant position among them. Poetry, more than any other kind of writing, demonstrates in text the power of signs traced on paper to convey nature's and art's images of sensible things. According to Bruno, poetry 'knows how to twist empty words into ordered ideas'[374] and create more freely this game of associations. Bruno's own poetic images do not only have a semantic character but are objects which operate in a mnemonic space and are viewed by inner vision or imagination. This

---

[370] Giordano Bruno, *On the Composition of Images, Signs & Ideas*, ed. Dick Higgins, trans. Charles Doria (New York: Wills, Locker & Owens, 1991).
[371] Ibid., p. xxi.
[372] Book one, Part One, Chapter Ten. Ibid., p. xxxvi.
[373] For true philosophy, music or poetry is also painting, and true painting is also music and philosophy, and true poetry or music is a kind of divine wisdom and painting.
[374] Bruno, *On the Composition of Images, Signs & Ideas*, p. xxii.

claim not only brings Bruno closer to poets like Simonides – father of mnemonics – who manifested the relation between painting and poetry, but also to Optatianus and his object-poems and Mallarmé, who believed in the musical power of words and envisaged his books as musical symphonies and paintings composed by words and who viewed his poems as objects of contemplation, like looking through a window.

In *On the Composition of Images, Signs & Ideas*, Book Three, Chapter Seven entitled *Seal six, The Tree,* Bruno draws an image of a palindromic 'mnemonic tree'. As we have seen, 'mnemonic trees' were developed by philosophers like Llull or by Camillo to denote that an idea or concept can develop randomly like a branching structure or a web, rather than linearly. The space this 'mnemonic tree' occupies is like that of a physical tree with its roots, trunk, branches and leaves growing randomly in all directions. Bruno continues with a poem explaining this image, and how in particular a palindromic tree operates and what manifests, providing also an image of this tree:

> The tree's roots and trunk refer to the chain,
> And are soon multiplied by branching in the same series.
> For, just as you seize things here, one by one
> In their ascent and descent, here they change
> as well from left to right,
> And you will understand inside, outside, forwards, backwards,
> So that bark and pith become known to you,
> Root, trunk, branch, palm, frond, seeds, flowers.
> For this reason, see it as rising up into a pyramid,
> From which there comes growing judgement,
> wealthy intention;
> For whatsoever you wish to comprehend
> from the monuments of others'
> And from your own light, and in their true order,
> And whatsoever you wish to be given
> as what has been investigated
> Or appealed to as what has been thoroughly gone into,
> We bid you to recall them to the norm of this plant.
> Here are the roots which are from the first origin,
> I mean the first beginning, that which founds things,
> cause and element.
> To the trunk refer whatever is essence and being,

Let the different approaches be the branches; let the flowers
Signify virtue's honors, fit the effects to the fruit;
The leaves which refresh and ornament
you may consider the circumstances.
After that, around the extended roots of one tree
Let the plants' offspring grow everywhere in a circle.
At this point there appears the great forest's
most celebrated species;
From this tree Raymond Llull once plucked fruit
Of an obviously other genus, because he saw the knowable
In the forest's members. The root which sensate power
Is, however, for us an internal trust principally.
Let us refer the problem to its twin the trunk, so that,
While one of its parts may be reduced to ash
by reason's vigorous flame,
The other can grow strong on worthwhile nourishment.[375]

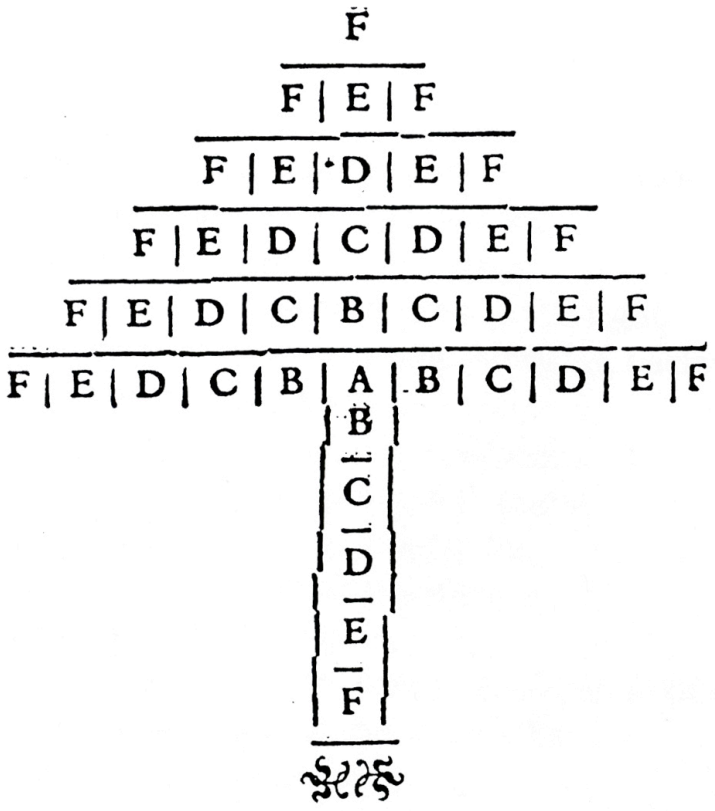


Figure 136 Giordano Bruno, palindromic mnemonic tree, 1591. From *On the Composition of Images, Signs & Ideas*, New York, 1991.

[375] Ibid., p. 126.

This tree (fig. 136) is composed by an argument based on the palindromic sequence of elements FEDCB**A**BCDEF. These elements could of course be letters, words concepts or ideas, images or seals, as Bruno would claim. Because of their symmetric, reversible or palindromic characteristic, their spatial arrangement escapes two dimensions, the plane, and extends to a different kind of space which is three-dimensional, temporal as well as moral and existential. The argument, the image and the poem of the palindromic tree start from the 'roots and trunk', which 'refer to the chain', or the palindromic sequence FEDCB**A**BCDEF visualised as the trunk in Bruno's image. Once the palindrome's function is realised, you have the ability to move upwards and downwards within this chain, 'just as you seize things here, one by one, In their ascent and descent …'. Then it is easy to imagine that you have the option, if you wish, to transfer these characteristics to more directions, left and right or even more forwards and backwards, 'as well from left to right, And you will understand inside, outside, forwards, backwards'. Like this the palindromic argument acquires spatial qualities and this is the first step towards capturing the whole image, 'rising up like a pyramid' extending to space like a tree with 'root, trunk, branch, palm, frond, seeds, flowers', each of them signifying 'cause and element, essence and being, virtue's honors, effects and circumstances'. More or less this tree stands for everything that, according to Bruno, creates experience in space, a space which is not only based on width, depth and height but also has motional, temporal, moral and existential properties.

Such a palindromic tree demonstrates how an argument's movement could generate spatial experience or the other way round, how spatial experience and understanding is an argument in constant motion; a continuous self-generated, self-consuming or self-reflective process based on words and language's character, to

carry meanings and be contemplative. 'For whatsoever you wish to comprehend … to be given …, or appealed …, we bid you to recall them to the norm of this plant'. And by this continuing process you can create more and more trees of this sort, enrich more and more this space until it becomes a forest which can never be destroyed or burned, as the very own tree's roots contain the genetic code 'chain' of its renewal, an obvious mnemonic procedure like the one described in the introduction for the ancient Latin palindrome. 'While one of its parts may be reduced to ash by reason's rigorous flame, the other can go strong on worthwhile nourishment.'

According to Bruno, any argument based on a tree-like sequence has abilities of various combinations and grows in many unpredictable combinations. This has been demonstrated by previous examples, such as Llull's 'mnemonic trees'. The difference between these other examples and Bruno's tree is that with a palindromic operation any argument can be extended to a different realm, escape the page and become a space, a forest, with all possibilities of movement within. Bruno, referring to Llull and his book *De arbore scientiae* (On the tree of knowledge), claims that Llull's attempts are 'futile and empty', because 'of their time's defect',[376] which possibly means that they don't take into consideration time, or that their temporal values are problematic. It seems that for Bruno a palindromic arrangement solves the problem of time, creating such a multiplicity of experience that transcends the spatial realm of bodies and existence itself.[377]

Bruno continues, noting that this tree, having all the qualities of the physical world, casts a shadow which takes the form of a circle. This shadow, by following a strict mathematical but at the same time poetic process, escapes the space of the text and becomes reality. This circle is divided into two parts, and from there again to two

[376] Ibid., p. 248.
[377] Ibid.

more, and goes on in a continuous process of 'two-member bipartite divisions'.[378] This process of divisions of the palindrome's shadow creates a 'growth' of pairs which enlarges constantly, pushing the multiplicity of these pairs to their 'extreme differences',[379] until infinity. From that point and onwards and by squaring or growing the circle, together with its divisions, Bruno slowly starts to create the universe, the sun, the moon, the stars, the planets and the explanations of things. It is interesting in Bruno's image that pairs of extreme differences of concepts like 'light and shadows, cold and hot … thick and thin'[380] consist the foundation of rhetoric, language and the world itself, like a Pythagorean or a post-structuralist.

As has been mentioned before, there is no such thing as rational reading for Bruno, but he seems to claim that the world is a process of endless combinations of 'seals', which are made from images that by their turn are made up of concepts and words, all of them gathered, arranged, distributed, combined and then in their turn combined with other 'seals' in infinite possibilities manifested by complicated mathematical calculations in someone's imagination. All these interwoven seals generate a nexus so dense it becomes a real object itself; not only Bruno's book *On the Composition of Images, Signs & Ideas*, but also the image of the universe or even the universe itself. The key to understanding is combination. Upon closing his book at the last thirtieth seal or 'the combiner', Bruno asks the rhetorical question:

> And what limit can there be in this sort and in similar and in all sorts of discoveries, where one seal's form, material, virtue, means, operation, effect and end unite with the same similar, different and the contraries of other seals, and, by a separate plan of movement, scurry away from them?[381]

[378] Ibid., p. 250.
[379] Ibid.
[380] Ibid.
[381] Ibid., p. 274.

The palindrome is a form of argument that manifests simply and clearly the above possibilities of combinations with the 'similar, different and contraries'. Palindromic values, *mirrored symmetry*, motional and temporal *reversibility* and *cancellation of meaning* open up textual experience to a process of combinations which is mechanistic and self-referential. Such a palindromic process has the ability to move in all various directions simultaneously while remaining the same, becoming solid and spatial. This process is similar to that described by Baudrillard, who saw in the palindrome a way of destabilising the relations between signifier and signified, opening up to a space of arbitrary connections in the creation of meaning. But also Bruno's palindromic trunk of his mnemonic tree – FEDCBABCDEF – strongly recalls Polieri's sequence of spoken, gestural and pure signs – dancer/mime/actor/singer/actor/mime/dancer – in *Gamme de 7*, upon which his play would acquire its proper, spatial scale, moving away from the traditional, linear and one-dimensional perspective.

Bruno's example is very significant because it provides a very specific methodology of how palindromic space is experienced. In all examples so far palindromes were used individually or as parts of larger compositions to either hold the parts of the composition together or to generate a spatial experience. But none of these examples explained how palindromes actually manage to keep the parts of a composition together. How they create the experience of palindromic space? Although it might seem like a complicated example it puts the reader's imagination into the process of palindromic activity. Bruno in this case directly relates writing to architecture because his methodology is based on a design process which starts from text and through poetic transformations of a geometric nature – based on symmetric distribution of concepts and images – crosses to a solid structure of the world. Both in

text or space this structure takes the form of a pyramid (tree-like structure) or pyramidal dome (that casts the shadow of a circle) and we can see clearly the relation between domes, arches and palindromes within the tradition of spatial writing. Design in Bruno's example relates poetry to spatial experience and transfers ideas from writing to architecture. IT is fascinating to play Bruno's palindromic game, follow the devices of such a transformation, and use this example to reflect on writing's contemplative character as a solid object and architecture's literary nature as an argument in motion.

A starting point for this research was to investigate why the palindrome is spatial. How can it be considered a spatial device and how it is possible to generate an opening to the poetic and, sometimes t, actual space. We looked in various examples from theory relating to the spatiality of the text, to find relations between the palindrome and architecture like the cases of Orpheus, Pythagoras, Plato, Latin sign theory, mnemonics, structural, and post-structural linguistics. But also we aimed to explore the palindrome's poetic space, examining how it operates in examples taken from books, drawings and buildings, as in Vitruvius, Camillo, Mallarmé, Polieri, Perec, Libeskind. But the spaces where palindrome in text and architecture most truly co-exist are domes, arches, passages, thresholds and stairs.

As they concern palindrome's poetic space, the palindromic values in word chains focus on the links rather than the elements themselves. Palindromes are links with the ability to open up to a poetic space of experience. Similarly in architecture built 'chains' such as thresholds, passages and stairs could be considered as the spaces of combination that contain potentially all possible connections between elements, those expected and those not, and that is why palindromes are often associated with them. Their structure is, like text, a sequence of elements that can contribute an

infinite multiplicity of combinations to the creation of the spatial experience. Thresholds and passages have the ability to link spaces as well as link the links between spaces, in all different directions. Stairs and corridors are made from distinct elements that reflect themselves and always have a centre of balance, a mirrored surface where are reflected moments in their temporal and motional repetition. And their function is based similarly to Bruno's example in 'two-member bipartite divisions', which pushes the multiplicity of their linked pairs or spaces to their 'extreme differences'. In simple words, thresholds, passages and corridors *look* simultaneously in two, or more, different directions exactly like the palindrome.

Domes arches and fountains are the other spaces traditionally associated with the palindrome, and this is mainly because of the similarities of their structures. A palindromic arrangement of letters could mirror the reflective structure of the elements that constitute a vaulted form or a dome; a poetic form for memory and the construction site. But if this characteristic has to do with the structure of the dome, the space these architectural features generate could be considered like the poetic space of the palindrome or, as manifested by Bruno's example, like the space produced by the shadow of the palindromic tree: a space of infinite associations based on bi-partite divisions of pairs of extreme differences.

This dissertation started from a subject like the palindrome, that at first sight seems to be overlooked, forgotten, a curiosity or even a folly. During the process the evidence has demonstrated that the palindrome is just a small part of a much wider subject, a very rich tradition of spatial writing that directly relates writing to architecture by using the same compositional or design methodologies. This tradition of spatial writing, although ancient is not yet researched properly in neither architecture, nor literary studies. Each of the examples analysed in this research could

be taken much further both in theory and in practise. Theoretical schools of thought like Latin sign theory and mnemonics and cases of philosophers like Bruno have been the focus of thorough research by scholars like Yates and later Carruthers. But there are fewer studies that connect these older theories to more recent ones like post-structural linguistics and other disciplines like in architecture, asade from Eriksen's example in literary studies and Libeskind's in architecture. Under a constantly developing concept like Rendell's site-writing, that sees writing as an active and critical practice for architecture, the study of a tradition of spatial writing – where palindrome plays only a very small part – could provide an insight how to use design and text as analytical and creative tools for both literature and architecture.

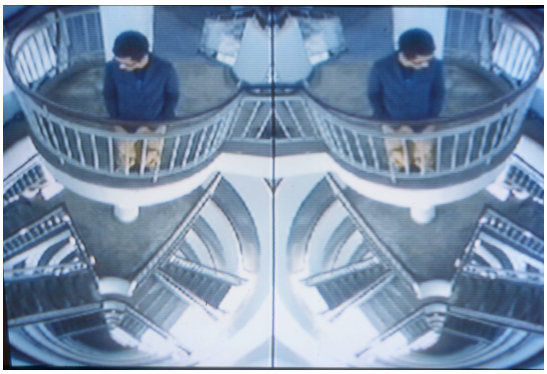
APPENDIX

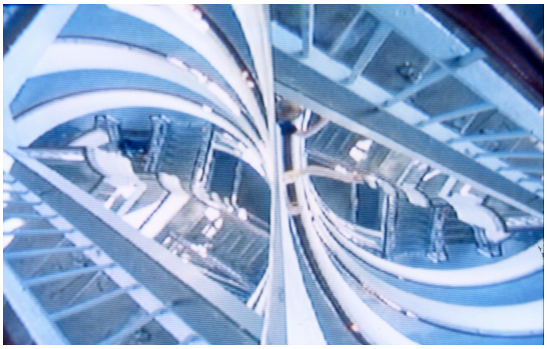
I am going to present here two projects that have been accomplished in the process of this research.

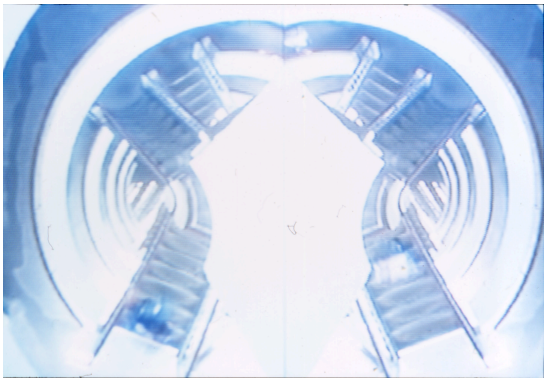
My own experimentation in space with palindromic values has been essential, not only to clarify the palindrome's definition but also to comprehend more clearly the issues raised by it. It has also been an opportunity to start investigating where palindromes are hidden in space and how architecture manifests palindromic characteristics. These include experiments in space with their visual, temporal and phonematic character by the use of audio-visual media. They also set up guidelines for future research on the subject and palindromic spatial applications.

The following two projects have already been completed.

Spatial Palindromes I (2003)







The first project is based on staircases as palindromic metaphors and the phonematic character of Georges Perec's *Les Grande Palindrome.* Staircases can be considered as a way of designing under constraint, like a text written under constraint. In stairs, as in palindromes, there is structurally a centre of balance where all of its distinct elements are mirrored – every step has its counter one – and although direction has two different alternatives, the route remains the same and can be read in a similar way. Even if time is linear, stairs can be experienced non-linearly, depending on direction, the location of the body inside the system, or circulation. Stairs have the ability of mirroring themselves as well as mirroring time. Using the same staircase throughout time, you mirror yourself in different but similar timelines. It is a repetitive procedure where palindromic movement lies in the fact that, although the content is the same, various almost imperceptible factors create the difference. You can read the same content in different directions and at different times while remaining within a constrained symmetry. Staircases, although belonging to a system, work independently of it. They constitute a system within a system, related to it but at the same time referring to itself. They break the linearity of space and, by implication, the 'irreversibility of time'.[382] This makes them a very particular spatial characteristic.

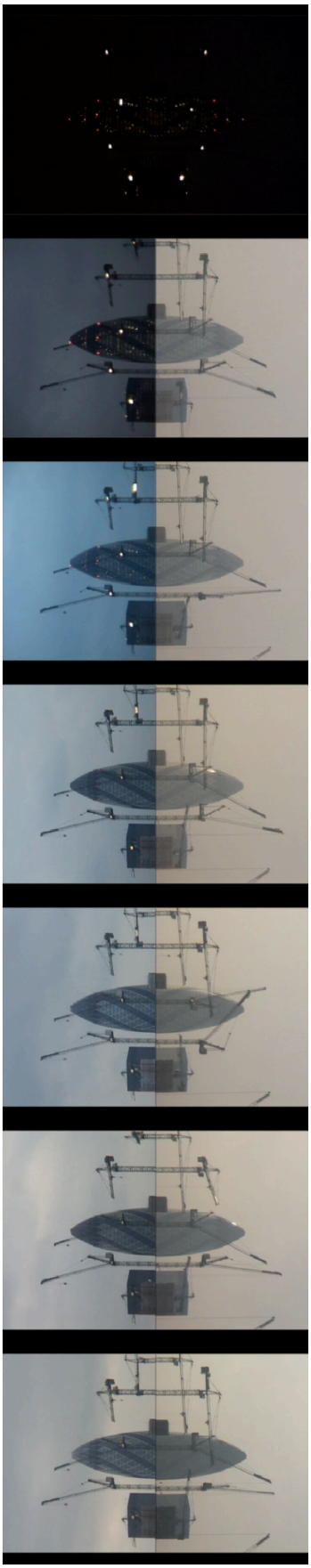
The value of mirrored symmetry has been chosen as a main feature for the editing of the video throughout its entire length. Split screens always show the same plane mirrored with different time variations, same time flow in both screens, very slight time differences between screens, acceleration of time in only one, or completely different time sequences of the same plane. The result also aims at a more graphical interpretation of structural elements as an attempt to alter their meaning, as

[382] Greber, *Palindrome Semiotics.*

happens in a palindromic text. The *Grande Palindrome* (1969) by George Perec is read both forwards and backwards as an attempt to examine its phonetic structure determining also the duration of the film. The combination of sound and image – both of them reflected – aims at the game of orientation and disorientation.

The video can be played backwards or forwards.

They are participating Efi Dementi, Ioannis Kouvidis and Stamatios Zografos. Voice by Aggelos Abazoglou.



EROS / SORE (2004)

In the beginning of Things, black-winged Night
Into the bosom of Erebos dark and deep
Laid a wind-born egg, as the seasons rolled,
Forth sprung Love, gleaming with wings of gold,
Like to the whirlings of wind, Love the Delight –
And Love with Chaos in Tartaros laid him to sleep;
And we his children, nestled, fluttering there,
Till he led us forth to the light of the upper air.
(from *The Birds*, Aristophanes)[383]

[383] Jane Ellen Harrison, *Prolegomena to the Study of Greek Religion* (Cambridge: Cambridge University Press, 1903), p. 626.

The second project is an attempt to create an architectural anagram and relates to the ancient pagan tradition of palindromes, representing the construction of the 'cosmic egg'.[384] According to the poetry of Orpheus, 'Love sprung out' of the cosmic egg and brought humans into the light. This video is experimenting mostly with the temporal values of the palindrome and Nietzsche's idea of 'Eternal Return of the Same'. Image and sound have been manipulated in endless loops, forward and backwards in time and by using over-layering techniques. It is an attempt to alter the meaning of architectural and spatial elements by using them in a more graphical way under constraint. Architecture is treated according to its geometrical values instead of in terms of function, politics or urban context; as happens with language in the palindrome. This gives an opening to a different space, that of the hidden poetic space of Orpheus or of Baudrillard's non-linear relation between sign and signifier in the anagram. Palindromic power lies in the struggle of bringing values together, combining them in one system, in the perception of opposite forces in balance, which strive to keep inside them the meaning we invest in architecture. It is the force that is trying to confine space and at the same time is trying to break out of the material boundaries.

The top of the Swiss Re building (Norman Foster, 2004) was filmed for twenty-four hours, taking three-second shots every ten minutes. The building was chosen because of its shape which mirrored could illustrate the image of the cosmic egg, of the cranes (the video aimed to illustrate the construction of the cosmic egg and the building at that point was under construction), and because skyscrapers are typologies often annotated with erotic metaphors.

[384] Marcel Detienne, *The Writing of Orpheus: Greek Myth in Cultural Contact* (Baltimore and London: John Hopkins University Press, 2002). Harrison, *Prolegomena to the Study of Greek Religion.*

In the editing both screens start at the same point in space–time, 24:00; then one starts moving forwards in space–time and the other backwards. Each screen completes a perfect circle and then they flip over. There is no beginning or end and the sequence can be repeated endlessly.

The soundtrack was composed by music producer Robin Morisson who used techniques similar to the editing. Morrison manipulated the original sounds of the recording in loops, over-layered, reversed and mirrored in time.

The whole experience aims for the viewer to stand in the ‘gateway’ from where he or she can experience the ‘eternal return of the same’ at the moment before the beginning of time, or the birth of Eros.

Bibliography

Albertus, Magnus Saint. *Albertus Magnus: Being the Approved, Verified, Sympathetic and Natural Egyptian Secrets; or, White and Black Art for Man and Beast ... Translated from the German, Etc*. New York, 1880.

Almeida, Rogério Miranda de. *Nietzsche and Paradox*. Translated by Mark S. Roberts. New York: State University of New York, 2006.

Architectures of Poetry. Edited by Maria Eugenia Diaz Sanchez and Craig Douglas Dworkin. Amsterdam and New York: Rodopi, 2004.

Artificial Memory. W. Ritchie: Liscard, 1902.

Augarde, Tony. *The Oxford Guide to Word Games*, 2nd ed. Oxford and New York: Oxford University Press, 2003.

Axelos, Kostas. *Héraclite Et La Philosophie. La Première Saisie De L'être En Devenir De La Totalité.* Paris: Éditions de Minuit, 1962.

Baak, J. J. van. *The Place of Space in Narration: A Semiotic Approach to the Problem of Literary Space, with an Analysis of the Role of Space in I.E. Babel's Konarmija*. Amsterdam: Rodopi, 1983.

Barry, Kieren. *The Greek Qabalah: Alphabetic Mysticism and Numerology in the Ancient World*. York Beach, ME: Samuel Weiser, 1999.

Barsani, Leo. *The Death of Stéphane Mallarmé*. Cambridge: Cambridge University Press, 1982.

Barthes, Roland, Richard Miller, and Honoré de Balzac. *S–Z*. London: Cape, 1975.

Baudrillard, Jean. 'Hystericizing the Millennium'. In *L'illusion De La Fin: Ou La Greve Des Evenements*. Paris: Galilee, 1992.

———. 'Reversion of History'. In *L'illusion De La Fin: Ou La Greve Des Evenements*. Paris: Galilee, 1992.

———. *Symbolic Exchange and Death*. Translated by Iain Hamilton Grant. London, Thousand Oaks and New Delhi: Sage, 2002.

———. ‘The Extermination of the Name of God’. In *Symbolic Exchange and Death*. London: Sage, 1993.

Beane, W.C., ed. *Myths, Rites and Symbols: A Mircea Eliade Reader*. New York: Harper and Row, 1976.

Bellos, David. *Georges Perec: A Life in Words*. London: Harvill, 1993.

Belsey, Andrew. *A Short Treatise on the Art of the Palindrome*. Cardiff (Department of Philosophy, University College, PO Box 78, Cardiff): A. Belsey, 1984.

Bergerson, Howard W. *Palindromes and Anagrams*: New York: Dover Publications, 1973.

Bergson, Henri. *Matter and Memory*. New York: Zone, 1988.

Bernard Tschumi. Edited by Giovanni Damiani. London: Thames and Hudson, 2003.

Bersani, Leo. *The Death of Stéphane Mallarmé*. Cambridge: Cambridge University Press, 1982.

Betegh, Gábor. *The Derveni Papyrus: Cosmology, Theology and Interpretation*. Cambridge: Cambridge University Press, 2004.

Bloomer, Kent C., Charles Moore, and Robert J. Yudell. *Body, Memory and Architecture*. New Haven and London: Yale University Press, 1977.

Bond, Frederick Bligh, and Thomas Simcox, *A Preliminary Investigation of the Cabala Contained in the Coptic Gnostic Books and of a Similar Gematria in the Greek Text of the New Testament, Etc*. B. H. Blackwell: Oxford, 1917.

Borges, Jorge Luis. ‘The Garden of the Forking Paths’. In *Labyrinths: Selected Stories and Other Writings*, edited by James E. Irby and Donald A. Yates. London: Penguin Books, 1980.

Born, William. *Modern Visual Poetry*. London: Associated University Press, Inc., 2001.

Boyd, Jennifer. *Frank Norris: Spatial Form and Narrative Time*, *American University Studies. Series Xxiv, American Literature; V. 43*. New York: P. Lang, 1993.

Boym, Svetlana. *Death in Quotation Marks: Cultural Myths of the Modern Poet*. Cambridge, MA: Harvard University Press, 1991.

Bruno, Giordano. *On the Composition of Images, Signs & Ideas*. Translated by Charles Doria. Edited by Dick Higgins. New York: Wills, Locker & Owens, 1991.

———. *The Heroic Enthusiasts (Gli Eroici Furori): an Ethical Poem, Part the First*. Translated by L. Williams. London: George Redway, 1887.

Bruno, Giuliana. *Public Intimacy: Architecture and the Visual Arts*. Cambridge, MA; London: MIT, 2007.

Bursen, Howard Alexander. *Dismantling the Memory Machine: A Philosophical Investigation of Machine Theories of Memory*. Dordrecht: Reidel, 1978.

Byatt, A.S. 'On Histories and Stories'. In *Selected Essays*: Vintage, 2001.

Calvino, Italo. *If on a Winter's Night a Traveler*. New York: Harcourt Brace Jovanovitch, 1981.

Camillo, Giulio ca. *L'Idea del Teatro E Altri Scritti Di Retorica*. Torino: RES, 1990.

Carlson, Marvin. *The Haunted Stage: The Theatre as Memory Machine*, *Theater: Theory/Text/Performance*. Ann Arbor: University of Michigan Press, 2001.

Carruthers, Mary. 'Inventional Mnemonics and the Ornaments of Style: The Case of Etymology'. Review of Reviewed Item. *Connotations*, no. 2 (1992), http://www.uni-tuebingen.de/uni/nec/carruthe22.htm.

———. *The Book of Memory: A Study of Memory in Medieval Culture*. 2nd ed. Cambridge Studies in Medieval Literature. Cambridge: Cambridge University Press, 2008.

———. *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400–1200*. Cambridge: Cambridge University Press, 1998.

———. *The Book of Memory: A Study of Memory in Medieval Culture*. Cambridge: Cambridge University Press, 1990.

Carruthers, Mary, and Jan M. Ziolkowski, eds. *The Medieval Craft of Memory: An Anthology of Texts and Pictures*, *Material Texts*. Philadelphia, PA: University of Pennsylvania Press, 2002.

Certeau, Michel de. *Heterologies: Discourse on the Other*. Manchester: Manchester University Press, 1986.

Chisholm, A. R. *Towards Herodiade: A Literary Genealogy*. Melbourne: Melbourne University Press, 1934.

Cicero, Marcus Tullius. *Ad C. Herennium, De Ratione Dicendi. Rhetorica Ad Herennium*. Translated by Harry Caplan. London and Cambridge: William Heinemann and Harvard University Press, 1954.

Cobbing Bob, Mayer Peter. *Concerning Concrete Poetry*. London: Writers Forum, 1978.

Cœlum Orbis Teutonici Excellenti Rursus Luce Sua Nitescens Quando Augustissimus Potentissimus Ac Invictissimus Dom. Dominus Franciscus Stephanus ... 13tia Septembris Electus Romanorum Imperator Semper Augustus (Romanorum Imperator Esset Coronandus). [Verses, Anagrams, Chronograms and Similar Pieces, with Illustrations.]. Moguntiæ: Per Johann Leonardum Ockel, 1745.

Cohn, Robert Greer. *Mallarmé's Masterwork New Finding*. The Hague: Mouton & Co, 1966.

———. 'Mallarmé's Un Coup De Dés: An Exegesis [a Thesis. With a Facsimile of the Paris, 1914, Edition of Un Coup de Des jamais n'abolira le Hasard]'. New Haven, 1949.

Colonna, Francesco. *Hypnerotomachia Poliphili. The Strife of Love in a Dream*. Translated by Joscelyn Godwin. London: Thames & Hudson, 2003.

Consenstein, Peter. *Literary Memory, Consciousness, and the Group OuLiPo*, *Faux Titre, 0167–9392; No. 220*. Amsterdam and New York, NY: Rodopi, 2002.

Conway, Peter. *The Palindrome*. London: Andrew Dakers Limited, 1951.

Cornford, Francis M. *Plato's Cosmology: The Timaeus of Plato*. Indianapolis and Cambridge: Hacket Publishing Company, 1997.

Corvin, Michel. *Polieri: A Visionary Passion*. Translated by Ann Sautier-Greening. Paris: Adam Biro, 1998.

———. *Polieri Un Passion Visionnaire*. Paris: Adam Biro, 1998.

Couliano, Ioan P. *Eros and Magic in the Renaissance*. Translated by Margaret Cook. Chigaco: University of Chigaco Press, 1987.

Cowling, David. *Building the Text: Architecture as Metaphor in Late Medieval and Early Modern France.* Oxford: Clarendon Press, 1998.

Delevoy, Robert L. *Symbolists and Symbolism*. Geneva: Albert Skira SA, 1978.

Denomme, Robert T. *The French Parnassian Poets*. Carbondale, Edwardsville: Southern Illinois University Press, 1972.

Detienne, Marcel. *The Writing of Orpheus: Greek Myth in Cultural Contact*. Baltimore and London: John Hopkins University Press, 2002.

Díaz Sánchez, María Eugenia, and Craig Douglas Dworkin. *Architectures of Poetry*, *Internationale Forschungen Zur Allgemeinen Und Vergleichenden Literaturwissenschaft, 0929–6999; 79*. Amsterdam and New York, NY: Rodopi, 2004.

Doob, Penelope Reed. *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. Ithaca and London: Cornell University Press, 1990.

Dronke, Peter. *Fabula; Explorations into the Uses of Myth in Medieval Platonism*. Leiden and Koln: E.J. Brill, 1974.

Dunstan, Graham Martin. *The Architecture of Experience: A Discussion of the Role of Language and Literature in the Construction of the World*. Edinburgh: Edinburgh University Press, 1981.

Eagleton, Terry. *Literary Theory: An Introduction*. Indianapolis and Cambridge: Hackett Publishing Company, 1996.

Eisenstein, Elizabeth L. *The Printing Press as an Agent of Change. Communications and Cultural Transformations in Early-Modern Europe*. Vol. 2. Cambridge: Cambridge University Press, 1979.

Eliade, Mircea. *The Myth of the Eternal Return: Cosmos and History*. Translated by William R. Trask. London: Arkana, 1989.

Eriksen, Roy. *The Building in the Text: Alberti to Shakespeare and Milton*. Pennsylvania State University Press, 2001.

Florence, Penny. *Mallarmé Manet and Redon: Visual and Aural Signs and the Generation of Meaning*. Cambridge: Cambridge University Press, 1986.

———.*Stéphane Mallarmé Un Coup de Dés jamais n'abolira le Hasard = Casting the Dice Once Never will Abolish Chance*. Multimedia presentation edited, translated and introduced by Penny Florence. Oxford: European Humanities Research Centre, 2000.

Fludd, Robert. *On the Divine Numbers and the Divine Harmony*. Translated by General Charles A. Rainsford. Edited by Adam McLean. Vol. 24. Glasgow: Magnum Opus Hermetic Sourceworks, 1997.

———. *The Origin and Structure of the Cosmos, Books One and Two of Tractate One from Volume One of Utriusque Cosmi Historia*. Translated by Patricia Tahil. Edinburgh: Magnum Opus Hermetic Sourceworks, 1982.

Fogel, Stan. 'Palinodes and Palindromes'. *International Fiction Review* 11, no. 1 (1984).

Forty, Adrian. *Words and Buildings: A Vocabulary of Modern Architecture*. London: Thames & Hudson, 2000.

Frank, Ellen Eve. *Literary Architecture, Essays Towards a Tradition, Walter Pater, Gerard Manley Hopkins, Marcel Proust, Henry James, Elen Eve Frank*. Berkeley: University of California Press, 1979.

Frank, Joseph. *The Idea of Spatial Form*. New Brunswick and London: Rutgers University Press, 1991.

Friedman, John Block. *Orpheus in the Middle Ages*. Syracuse, NY: Syracuse University Press, 2000.

Garin, Eugenio. *History of Italian Philosophy*. Translated by Giorgio Pinton. 2 vols. Amsterdam and New York: Rodopi, 2008.

Gibson, Michael. *Symbolism*. Koln: Taschen, 1999.

Gilbert, Everett Katharine. *Aesthetic Studies: Architecture and Poetry*. Durham, NC: Duke University Press, 1952.

Gilmore, Grant. 'Stéphane Mallarmé: A Biography and an Interpretation'. PhD Thesis, Yale University, 1936.

Greber, Erika. ‘Biltworter, Wortbilder: Palindrom Und Ambigram Als Minimalistiche Kunstformen’. *Minimalismus*, Wien, Gesellschaft zur Förderung Slawistischer Studien, 2001.

———. Palindrome Semiotics. *A Chronotope of Revolution: The Palindrome from the Perspective of Cultural Semiotics*, http://www.realchange.org/pal/semiotic.htm (accessed 4 May 2005).

———. ‘Wendebuchstaben, Wendebuilder: Palindromanie Der Jahrtausendwende’. In *Materialitat Und Medialitat Von Scrift*. Bielefeld, 2002.

Guthrie, W.K. *Orpheus and Greek Religion: A Study of the Orphic Movement*. Methuen, 1935.

Harris, Roy. *Language, Saussure and Wittgenstein: How to Play Games with Words*. London and New York: Routledge, 1990.

Harrison, Jane Ellen. *Prolegomena to the Study of Greek Religion.* Cambridge: Cambridge University Press, 1903.

Hartt, Frederick. *A History of Italian Renaissance Art*. London: Thames and Hudson, 1980.

Hathorn, Yancey Richmond. *Greek Mythology*. Beirut: American University of Beirut, 1977.

Hersey, George L. *Architecture and Geometry in the Age of Baroque*. Chicago and London: University of Chicago Press, 2000.

———. *Pythagorean Palaces: Magic and Architecture in the Italian Renaissance*. Ithaca and London: Cornell University Press, 1976.

Higgins, Dick. *Pattern Poetry: Guide to Unknown Literature.* Albany: State University of New York Press, 1987.

Houédard, Sylvester Dom. ‘Between Poetry and Painting: Chronology’. London: Institute of Contemporary Arts, 1965.

Hugo, Victor. *Les Misérables*. Paris: Ernest Flammarion, 1862.

Irvine, William, and Steven Guarnaccia. *Madam I’m Adam – and – Other Palindromes*. London: Robson, 1990, 1987.

Jackson, George. *A New and Imroved System of Mnemonics or Two Hours' Study in the Art of Memory Applied to Figures, Chronology, Geography, Statistics, History, Systematic Tables, Poetry, Prose and to the Common Transactions of Life*. London: Printed by the Author, 1817.

Jacques Polieri: Scenography and Technology. Edited by Franc Ancel & Michel Corvin. Paris: Bibliotheque Nationale de France, 2002.

Jammer, Max. *The History of Theories of Space in Physics*. London: Constable, 1993.

Johnson, Ben. *Poetry and Architecture*. Oxford: Clarendon Press, 1994.

Jones, Mark Wilson. 'Doric Measure and Architectural Design 1: The Evidence of the Relief from Salamis'. *American Journal of Archaeology* 104, no. 1 (2000): 73–93.

Kabbala Denudata, Seu Doctrina Hebræorum Transcendentalis Et Metaphysica Atque Theologica: Opus ... In Quo Ante Ipsam Translationem Libri ... Cui Nomen Sohar Tam Veteris, Quam Recentis, Ejusque Tikkunim ... Præmittitur Apparatus. Edited by C. Knorr von Rosenroth. 2 tom. vols, *Zohar*. Francofurti: Sulzbachi 1677–84.

Kahn, Charles H. *Pythagoras and the Pythagoreans. A Brief History*. Indianapolis, Cambridge: Hackett Publishing Company, Inc., 2001.

Keith, Critchlow. 'The Platonic Tradition on the Nature of Proportion'. In *Homage to Pythagoras: Rediscovering Sacred Science*, edited by Christopher Bamford. Hudson, NY: Lindisfarne Press, 1994.

Kingsley, Peter. *Ancient Philosophy, Mystery and Magic: Empedocles and Pythagorean Tradition*. Oxford: Clarendon Press, 1995.

Koch, Walter A. *Poetry and Science, Semiogenetical Twins: Towards an Integrated Correspondence Theory of Poetic Structures*. Narr: Tuubingen, 1983.

Kõiva, Mare. Palindromes and Letter Formulae: Some Reconsiderations, http://www.folklore.ee/Folklore/authors/mare.htm. (accessed 19 July, 2003).

Kort, Wesley A. *Place and Space in Modern Fiction*. Gainesville: University Press of Florida, 2004.

Kristeva, Julia. *Revolution in Poetic Language*. New York: Columbia University Press, 1984.

Kuberski, Philip. *The Persistence of Memory: Organism, Myth, Text*. Berkeley, Los Angeles, Oxford: University of California Press, 1992.

La Charite, Virginia A. *The Dynamics of Space: Mallarmé's Un Coup de Dés jamais n'abolira le Hasard*. Lexington: French Forum, 1987.

Le Parnasse Contemporain. SéRies 1–3. Recueil De Vers Nouveaux. Paris, 1866–76.

Leak, Andrew. 'Paris Created and Destroyed'. *AA Files*, 45–46 (2001).

Leon, Battista, Alberti. *A Treatise on Ciphers*. Translated by A. Zaccagnini. Torino: Galimberti, 1997.

Lethaby, Richard William. *Architecture, Mysticism and Myth*. London: Percival & Co, 1892.

Libeskind, Daniel. *Countersign*, *Architectural Monographs, 0141–2191; No. 16*. London: Academy Editions, 1991.

———. *Jewish Museum Berlin*. Munich, London, New York: Prestel Verlag, 1999.

Libeskind, Daniel, ed. *Monument and Memory*: Department of Art History and Archaeology, Columbia University, 2002.

Libeskind, Daniel, and Peter Eisenman. *Chamber Works: Architectural Meditations on Themes from Heraclitus*. London: Architectural Association, 1983.

Lloyd, Rosemary. *Mallarmé: The Poet and His Circle*. Ithaca, NY: Cornell University Press, 1999.

Lotman, Yuri M. *Giordano Bruno and the Hermetic Tradition*. Chicago and London: University of Chicago Press, 1991.

———. *The Structure of the Artistic Text*. Michigan: Michigan Slavic Contributions, 1977.

———. *Universe of the Mind: A Semiotic Theory of Culture*. Translated by Ann Shukman. London and NewYork: I.B. Tauris & Co. Ltd, 1990.

Loyd, Samuel the Younger. *Sam Loyd's Cyclopedia of 5000 Puzzles, Tricks, and Conundrums (with Answers)*. New York: Lamb Publishing Company, 1914.

Mack, Peter. ‘Early Modern Ideas of Imagination’. In *Imagination in the Later Middle Ages and Early Modern Times*, edited by Lodi Nauta and Detlev Pätzold. Leuven: Peeters; Hadleigh: BRAD [distributor], 2005.

Madam I’m Adam: A Book of Palindromes from Walker Izard. London: Walker Izard, 1991.

Maistre, Xavier François. *A Journey Round My Chamber*. Translated by Mrs John Outhwaite. London: J.M. Creery, 1818.

Mallarmé, Stéphane. *Selected Letters of Stéphane Mallarmé*. Translated by Rosemary Lloyd. Edited by Rosemary Lloyd. Chicago and London: University of Chicago Press, 1988.

———. *The Meaning of Mallarmé: A Bilingual Edition of His Poesies and ‘Un Coup de Dés’*. Translated by Charles Chadwick. Aberdeen: Scottish Cultural Press, 1996.

———. *Un Coup de Dés jamais n’abolira le Hasard: Edition Mise En Œuvre Et Presentee Par Mitsou Ronat*. Paris: D’Atelier, 1980.

———. *Un Coup de Dés jamais n’abolira le Hasard.* Paris: Nouvelle Revue Francaise, 1914.

———. *Un Coup De Dés: Typographic Translation by Neil Crawford*. London: Tetrad Press, 1985.

———. *Dice Thrown Never Will Annul Chance. A Translation by Brian Coffey, Etc*: Dolmen Press: Dublin, 1965.

Martin, Dunstan Graham. *The Architecture of Experience: A Discussion of the Role of Language and Literature in the Construction of the World*. Edinburgh: Edinburgh University Press, 1981.

Mathews, Harry, and Alastair Brotchie. *OuLiPo Compendium*. London: Atlas Press, 2005.

McEwen, Indra Kagis. *Vitruvius, Writing the Body of Architecture*. Cambridge, MA: MIT Press, 2003.

McGahey, Robert. *The Orphic Moment: Shaman to Poet-Thinker in Plato, Nietzsche, and Mallarmé*. Albany: State University of New York, 1994.

Mellors, Anthony Matthew. ‘Poetic Space and the Late Modernist Text: The Theory and Context of J.H. Prynne’s Writings from 1960–1974’. PhD Thesis, University of Oxford, 1992.

Merbitz, Joannes Valentinus. *M. J. V. Merbitzii De Varietate Faciei Humanæ Discursus Physicus. Appendicis Loco Accedunt Carmina Figurata Rabani Mauri*. Dresdae, 1676.

Millon, Henry A., and Vittorio Magnago Lampugnani. *The Renaissance from Brunelleschi to Michelangelo: The Representation of Architecture*. New York: Rizzoli, 1994.

Mortimer, Ivan M. Linforth. *The Arts of Orpheus*, *Philosophy of Plato and Aristotle*. New York: Arno Press, 1973 [c.1941].

Motte, Warren F. Jr., ed. *OuLiPo: A Primer of Potential Literature*. Lincoln, NE and London: University of Nebraska Press, 1986.

Mottram, Eric. *Towards Design in Poetry*. London: Writers Forum, 1977.

Moughtin, Cliff. *Urban Design: Street and Square*. 3rd ed. Amsterdam and London: Architectural Press, 2003.

Nietzsche, Friedrich. *Thus Spoke Zarathustra: A Book for All and None*. Translated by Walter Kaufmann. New York: Penguin, 1978.

Norberg, Dag. *An Introduction to the Study of Medieval Latin Versification*. Translated by Grant C. Roti & Jacqueline De La Chapelle Skuby. Edited by Jan Ziolowski. Washington DC: Catholic University of America Press, 2004.

Pazig, Christianus. *A Treatise of Magic Incantations; Translated from the Latin of Christianus Pazig (Circa 1700)*. Edinburgh: Privately printed, 1886.

Pearson, Roger. *Mallarmé and Circumstance: The Translation of Silence*. Oxford: Oxford University Press, 2004.

———. *Unfolding Mallarmé: The Development of a Poetic Art*. Oxford: Clarendon, 1996.

Pellizer, Ezio. *Interpretation of Greek Mythology; Reflections, Echoes and Amorous Reciprocity on Reading the Narcissus Story*. Translated by Diana Crampton. Edited by Jahn Bremer. London and Sydney: Croom Helm, 1987.

Perec, Georges. *A Void*. London: Harvill, 1994.

———. *Edna D'nilu / O, Mu, Acere*: Privately printed, 1969.

———. 'History of the Lipogram'. In *OuLiPo a Primer of Potential Literature*, edited by Warren F. Motte Jr., Lincoln, NE and London: University of Nebraska Press, 1986.

———. *La Disparition*. Paris: DENOEL, 1969.

———. *Life A User's Manual*. Translated by David Bellos. London: Collins Harvill, 1987.

———. *Species of Spaces and Other Spaces*: Penguin Books, 1997.

———. *W or the Memory of Childhood*. London: Collins Harvill, 1988.

Polieri, Jacques. *Scenographie, Semiographie*. Paris: Danoel / Gonthier, 1971.

Polieri: Creator of Modern Scenography. Paris: Bibliotheque nationale de France, 2002.

Porphyrius, Publilius Optatianus. *[Panegiricus ... Dictus Constantino Augusto, Etc.]*. [Another edition.] ed: Augustæ Videlicorum, 1595.

Porphyrius, Publilius Optatianus, and Giovanni Polara. *Publilii Optatiani Porfyrii Carmina*. Torino: In aedibus Paraviae, 1973.

Preston, Alessandro G. Farinella and Carole. 'Giordano Bruno: Neoplatonism and the Wheel of Memory in The "De Umbris Idearum"'. *Renaissance Quarterly* 55, no. 2 (2002): 596–624.

Queneau, Raymond. *100.000.000.000.000 Poems.* Paris: Kickshaws, 1983.

Queneau, Raymond, Italo Calvino, Paul Fournel, Claude Berge, Jacques Jouet, and Harry Mathews. *OuLiPo Laboratory: Texts from the Biblioteque Oulipiene*: Bath Press, 1995.

Quennell, Peter. *Baudelaire and the Symbolists*. London: Shenval Press, 1954.

Ramelli, Agostino, Martha Teach Gnudi, and Eugene S. Ferguson. *The Various and Ingenious Machines of Agostino Ramelli*. Johns Hopkins University Press; London: Scolar Press, 1976.

Rendell, Jane. 'Architecture-Writing'. *Journal of Architecture* 10, no. 3 (2005): 255–64.

Reynolds, Dee. *Symbolist Aesthetics and Early Abstract Art: Sites of Imaginary Space*. Cambridge: Cambridge University Press, 1995.

Riedweg, Christoph. *Pythagoras: His Life, Teaching, and Influence*. Ithaca, NY and Bristol: Cornell University Press and University Presses Marketing [distributor], 2005.

Robinson, Ira. *Moses Cordovero's Introduction to Kabbalah: An Annotated Translation of His or Ne'erav*. New York: Yeshina University Press, 1994.

Robinson, Kate. *A Search for the Source of the Whirlpool of Artifice: The Cosmology of Giulio Camillo*. Edinburgh: Dunedin Academic Press, 2006.

Romberch, Joannes. *Congestorium Artificiose Memorie ... Omnium De Memoria PreceptioẽS Aggregatim Complectens: Opus OĩBus Theologis: Predicatoribus Confessoribus ... Pernecessarium. G.L.* Venetiis: Per M. Sessam, 1533.

Rossellius, Cosmas. *Thesaurus Artificiosæ Memoriæ*. Venetii: Apud Antonium Paduanium, 1579.

Ryan, Marie-Laure. *Possible Worlds, Artificial Intelligence and Narrative Theory*. Indiana: University of Bloomington & Indianapolis Press, 1991.

Saiber, Arielle. *Giordano Bruno and the Geometry of Language*, *Literary and Scientific Cultures of Early Modernity*. Aldershot and Burlington, VT: Ashgate, 2005.

Sartre, Jean-Paul. *Mallarmé, or, the Poet of Nothingness*. University Park: Pennsylvania State University Press, 1988.

Schaffer, Aaron. *The Genres of Parnassian Poetry: A Study of the Parnassian Minors*. Baltimore, MA: The Johns Hopkins Press, 1944.

Schneider, Bernhard. *Daniel Libeskind: Jewish Museum Berlin: Between the Lines*. Munich and London: Prestel, 1999.

Seaman, David W. *Concrete Poetry in France*, *Studies in Fine Arts. The Avant-Garde; No.18*. Ann Arbor: UMI Research, 1981.

Segal, Charles. *Orpheus: The Myth of the Poet*. Baltimore and London: The John Hopkins University Press, 1989.

Sethuna, D.K. *The Obscure and the Mysterious: A Research in Mallarmé's Symbolist Poetry*. Pondicherry: Sri Aurobindo Ashram Trust, 1987.

Sharkey, John J. *Mindplay: An Anthology of British Concrete Poetry*. London: Lorrimer Publishing, 1971.

Singer, Waley Dorothea. *Giordano Bruno, His Life and Thought; with Annotated Translations of His Work on the Unfinite Universe and Worlds*. London: Constable and Company Ltd, 1950.

Smitten, Jeffrey R., and Ann Daghistany. *Spatial Form in Narrative*. Ithaca, NY and London: Cornell University Press, 1981.

Solt, Mary Ellen. *Concete Poetry: A World View*. Edited by Marry Ellen Solt and Barnstone Willis. Bloomington: Indiana University Press, 1968.

Spaeth, David. *Mies van der Rohe*. London: The Architectural Press, 1985.

St Aubyn, Frederic C. *Stéphane Mallarmé*. New York: Twayne Publishers, 1969.

Stambaugh, Joan. *Nietzsche's Thought of Eternal Return*. Baltimore and London: The John Hopkins Press, 1972.

Starobinski, Jean. *Words Upon Words: The Anagrams of Ferdinard de Saussure*. Translated by Olivia Emmet. New Haven, CT and London: Yale University Press, 1979.

Sugano, Marian Zwerling. *The Poetics of Occasion: Mallarmé and the Poetry of Circumstance*. Stanford, CA: Stanford University Press, 1992.

Swift, Jonathan. *Travels into Several Remote Nations of the World ... By Lemuel Gulliver ... Illustrated by Grandville ... With Copious Notes, a Life of the Author, and an Essay on Satiricial Fiction, by W. C. Taylor*: Hayward & Moore: London, 1840.

Symmes, Marilyn, ed. *Fountains Splash and Spectacle: Water and Design from the Renaissance to the Present*. London: Thames and Hudson, 1988.

Tabourot, Estienne. *Les Bigarrures Du Seigneur Des Accords – Les Apophtegmes Du Sieur Gaulard – Les Escraignes Dijonnoises; Tome Premier*. Bruxelles: A. Mertens et fils, 1866.

———. *Les Bigarrures Du Seigneur Des Accords: Premier Livre: Fac-Similé De L'eDition De 1588*. Genève, 1986.

Taylor, John. *The Nipping or Snipping of Abuses: Or the Woolgathering of Witte. With the Muses Taylor, Brought from Parnassus by Land, with a Paire of Oares ... And a Proclamation from Hell in the Devils Name, Concerning the Propogation [Sic] and Excessiue Use of Tobacco*. London: Griffin for Nathaniel Butler, 1614.

Tolic, Dubravka Oraic. *American Scream. Palindrome Apocalypse*. Translated by William E. Yuill Sibelan Forrester, and Sonja Basic. Portland: Ooligan Press and the Program of the Center of Excellence in Writing at Portland State University, 2005.

Trione, Aldo. *The Aesthetics of the Mind after Mallarmé*. Lewiston: The Edwin Mellen Press, 1996.

Tsur, Reuven. *On the Shore of Nothingness: Space, Rhythm, and Semantic Structure in Religious Poetry and Its Mystic-Secular Counterpart: A Study in Cognitive Poetics*. Thorverton: Imprint Academic, 2003.

Valéry, Paul Ambroise Toussaint Jules. *Eupalinos or the Architect*. Translated by William McCausland Stewart. London: Oxford University Press, 1932.

———. *On Collected Works of Paul Valéry; Vol. 8*. Edited by Jack Matthews. Princeton: Princeton University Press, 1972.

Vernant, Jean Pierre. *Myth and Thought among the Greeks*. New York: Zone; London: MIT [distributor], 2006.

Vitruvius. *Ten Books on Architecture*. Translated by Ingrid D. Rowland. Cambridge: Cambridge University Press, 1999.

Vitruvius Pollio, Marcus, and Daniello Patriarch of Aquileia Barbaro. *I Dieci Libri Dell'architettura Di M. Vitruvio Tradutti Et Commentati Da Monsignor Barbaro Eletto Patriarca D'aquileggia. Con Due Tavole. L.P*: Vinegia, 1556.

Vitruvius Pollio, Marcus, Cesare Cesariano, Augustino Gallo, and Alvisio da Pirovano. *Di Lucio Vitruuio Pollione De Architectura Libri Dece Traducti De*

Latino in Vulgare Affigurati: Comentati (Da Caesare Caesariano), Etc. [the Editors Named in the Colophon as Augustino Gallo and Alvisio Da Pirovano.]: Como: Gotardo da Pote, 1521.

Vos, Eric. *Concrete Poetry as a Test Case for a Nominalistic Semiotics of Verbal Art*. Amsterdam, 1992.

Waldrop, Rosmarie. *Against Language? 'Dissatisfaction with Language' as Theme and as Impulse Towards Experiments in Twentieth Century Poetry (De Proprietatibus Litterarum. Series Minor. No. 6).* The Hague and Paris: Mouton, 1971.

Watson, Lawrence J. 'Mallarmé's Mythic Language, Parnassean Philologie *in Mallarmé's Poetic Theory and Practice*. The Tallents Press, 1990.

Webster, Michael. *Reading Visual Poetry after Futurism, Marinetti, Apollinaire, Schwitters,Cummings*. New York: Peter Lang Publishing, 1995.

West, M.L. *The Orphic Poems*. Oxford: Clarendon Press, 1983.

Williams, Hether. 'Mallarmé and the Language of Ideas'. *Nineteenth Century French Studies* 29, no. 3 & 4 (2001).

Wind, Edgar. *Pagan Mysteries in the Renaissance*. London: Faber and Faber, 1968.

Wittkower, Rudolf. *Architectural Principles in the Age of Humanism*. New York, Weinheim, Brisbane, Singapore and Toronto: Academy Editions, 1998.

———. *Art and Architecture in Italy 1600–1750*. 3 vols. Vol. 2. *High Baroque 1626–1675.* New Haven and London: Yale University Press, 1999.

Yates, Frances Amelia. 'Architecture and the Art of Memory'. *Architectural Association Quarterly* 12, no. 4 (1980): 4–14.

———. *The Art of Memory*. London: Pimlico, 2003.

———. 'The Emblematic Conceit in Giordano Bruno's De Gli Eroici Furori and in the Elizabethan Sonnet Sequences'. *Journal of the Warburg and Courtauld Institutes* 6 (1943): 101–21.

Zweig, Janet. 'Ars Combinatoria: Mystical Systems, Procedural Art, and the Computer'. *Art Journal* 56, no. 3 (1997): 20–29.

Αξελός, Κώστας. *Ο Ηράκλειτος Και Η Φιλοσοφία* Αθήνα: ΕΞΑΝΤΑΣ, 1976.

Πλάτων. *Τίμαιος*. Translated by Βασίλης Κάλφας. Αθήνα: Πόλις, 1995.